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6 yds. " Gauze
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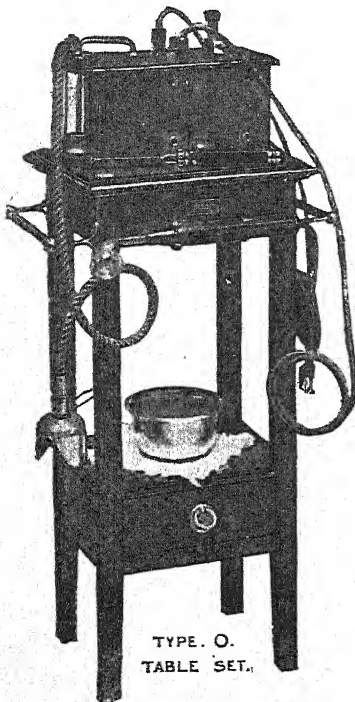
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An Instrument that will fully answer all requirements of the Specialist or the General Practitioner.

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Combines High Frequency and Actual Cautery.

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TYPE "S.B." in Oak or Mahogany, Carrying Case, complete - - - £12/12/0

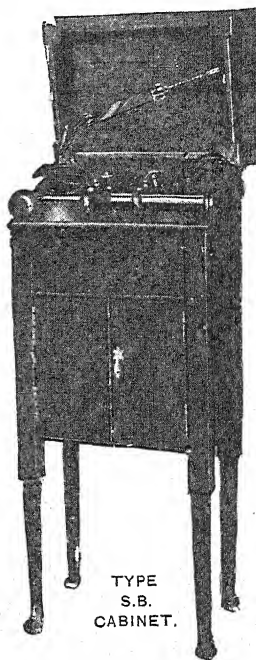
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PRICES:

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RECENT clinical experience of Detoxicated Vaccines has proved that they have a definite place in Vaccine Therapy. These preparations are essentially emulsions in saline of bacterial stroma, from which, by means of a special chemical process the toxic elements have been removed, and therefore doses 10 to 20 times greater than those of corresponding ordinary vaccines can be given without causing disturbing reactions, and further, their antigenic power of stimulating specific antibody production is claimed to be greater than that of ordinary vaccines.

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- (1) **PROPHYLACTIC INOCULATION** during the period of an epidemic of Influenza or Pneumonia, or under such circumstances, where the risk of infection is considerable, and the possibility of producing a temporary negative phase undesirable. This is best arranged for by three doses of Lancashire Detoxicated Influenza Vaccine at five days interval.
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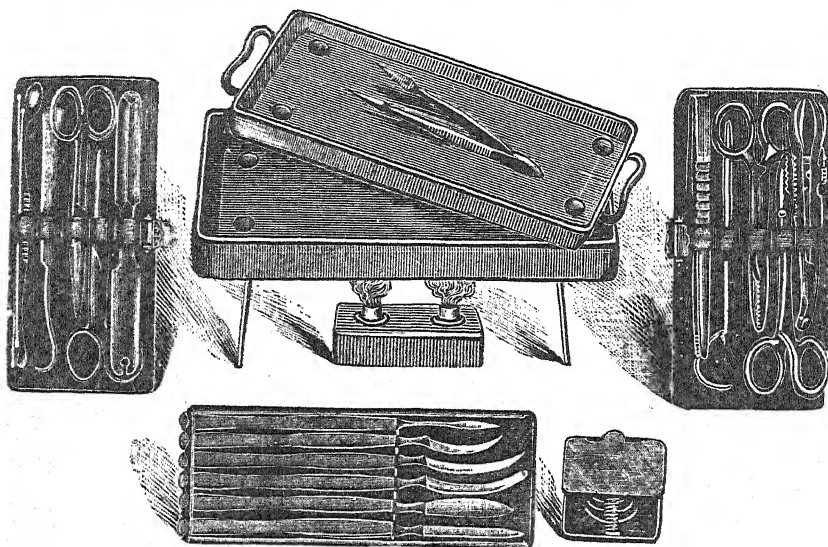
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ALL the Instruments are strictly aseptic, and of the highest finish. The Knives, of the best English make, are forged out of solid steel.

When not in use the Instruments lie on electro-plated trays in the metal case or sterilizer, which is enclosed in an outer case, the dimensions being 8 by 3 inches.

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The following is a list of contents:—

Needle Holding Forceps
Straight Aseptic Dressing Scissors
Curved ditto ditto
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Combined Spatula and Tongue
Depressor, with Frænum Slit
Tenaculum

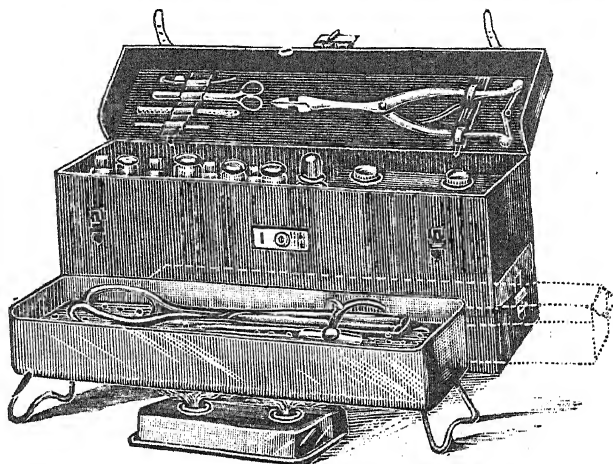
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Six Operating Knives
Needle Case with six Needles

Price for the whole set complete - £3 12s. 6d.

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MIDWIFERY BAG WITH STERILIZER.



The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

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PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush, Minim Measure in case, Chloroform Drop Bottle in case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

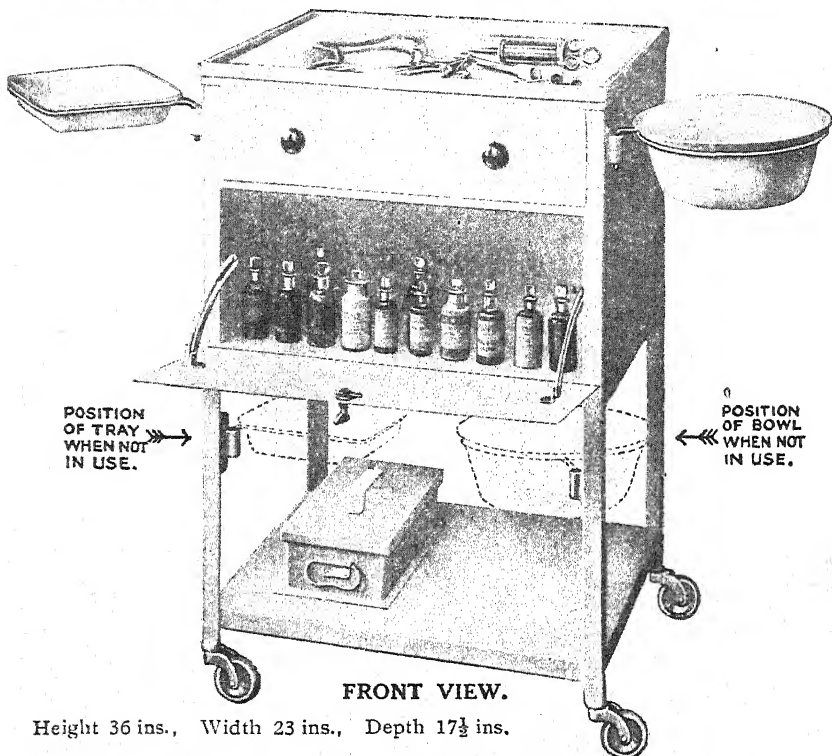
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A drawer for instruments which can be seen through the plate-glass top; below, a space for bottles with a drop front sliding on electro-plated quadrants.

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Five pigeon holes provided with boxes containing various dressings; below, a drawer for miscellaneous requirements.

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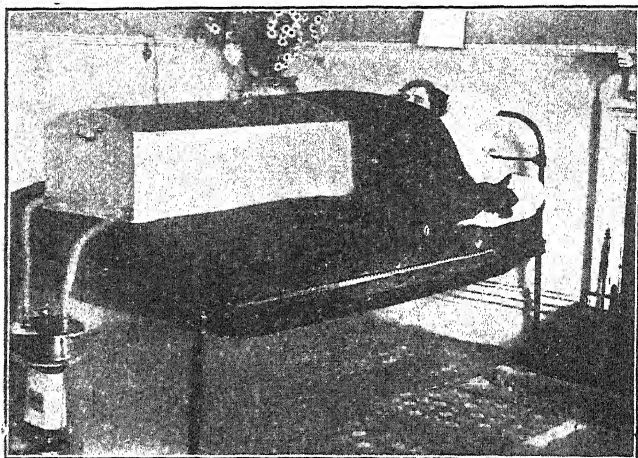
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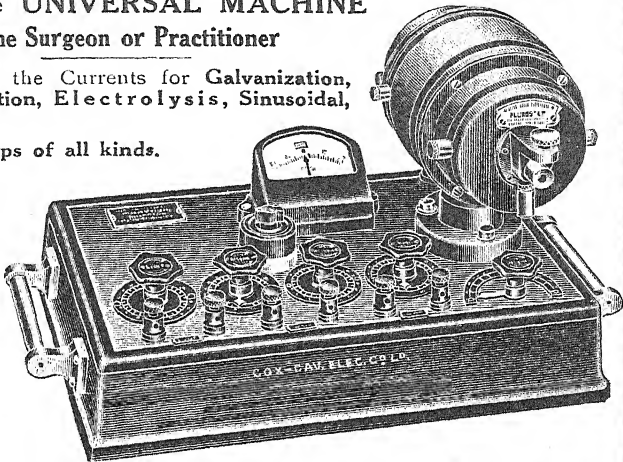
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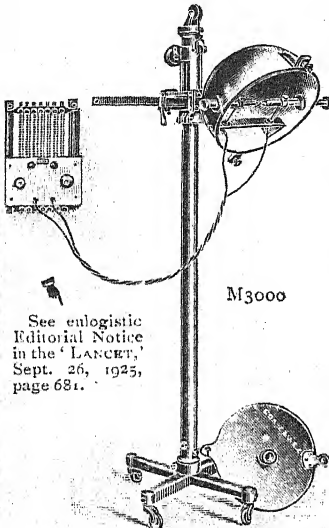
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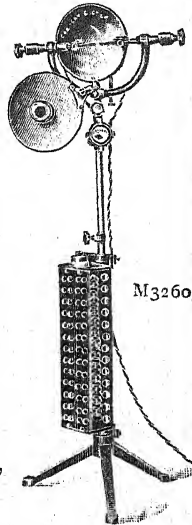
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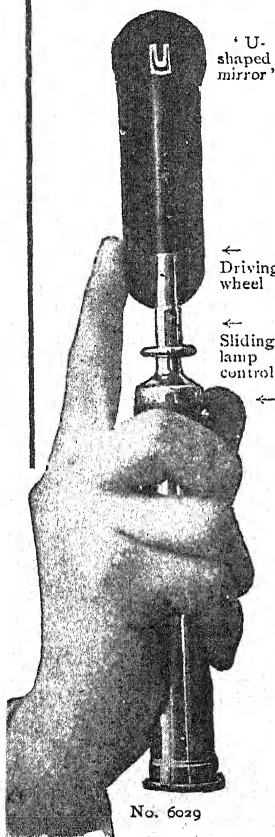
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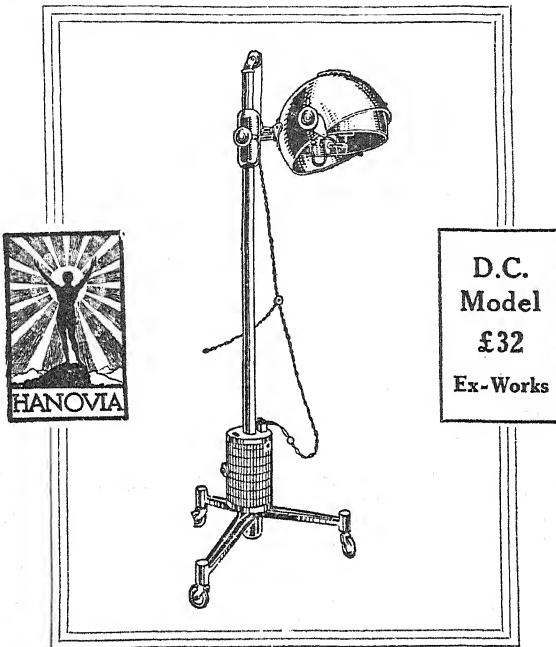
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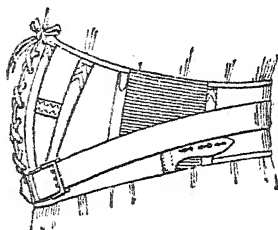
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Fit well, sit comfortably, and do not get out of place. They give great comfort and relief in all Abdominal Complaints, and after Operations.



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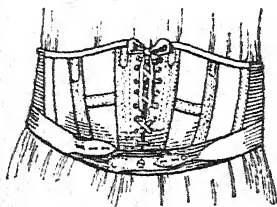
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With Pad and Spring.

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Useful in undue corpulency, its action is beneficial when the womb is pressed against the bladder; also in the pains often felt in the hips, loins, and sides. It is the best Gastropnoxis belt.

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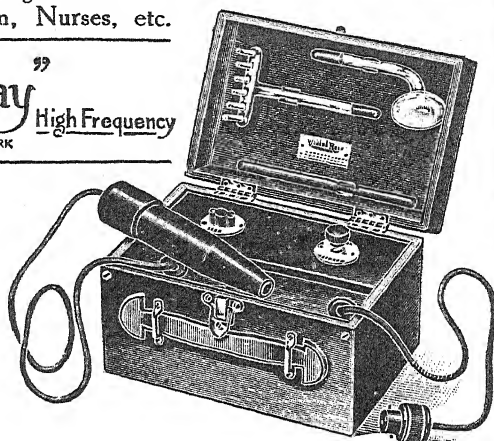
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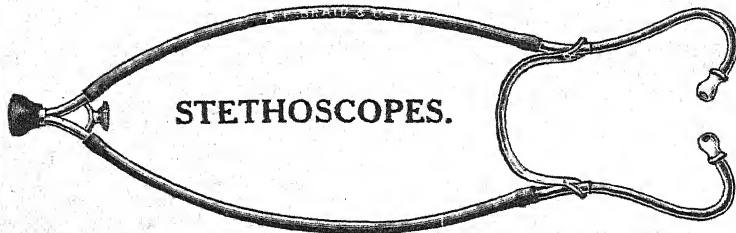
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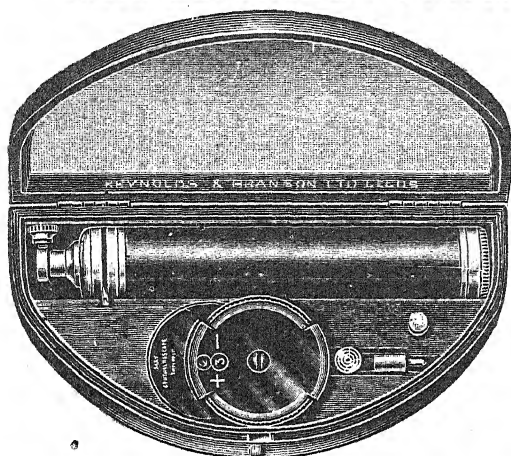
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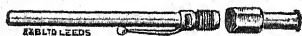
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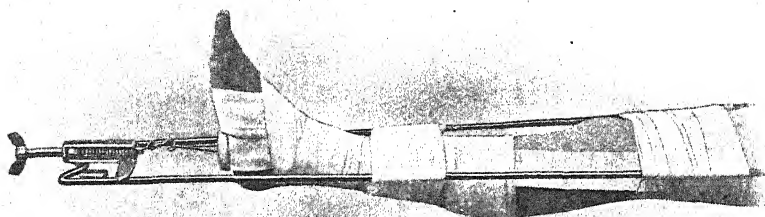
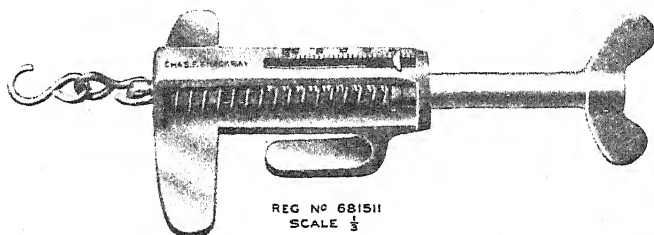
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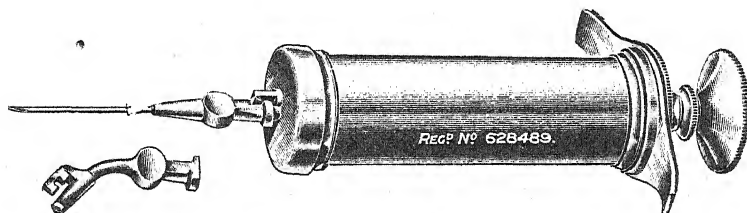
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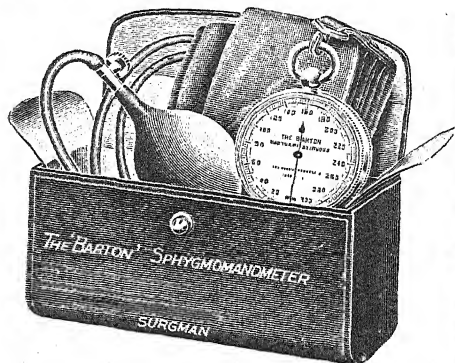
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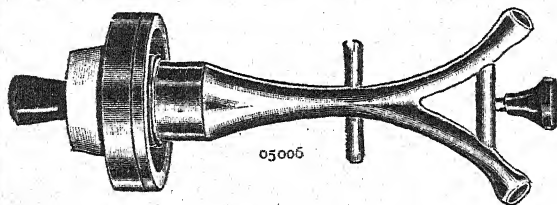


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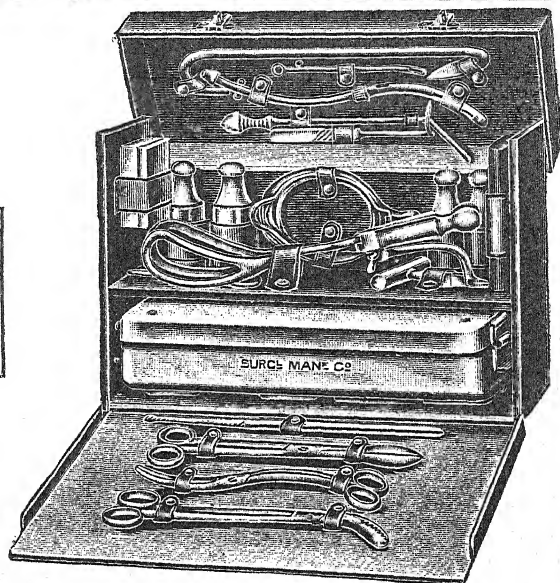
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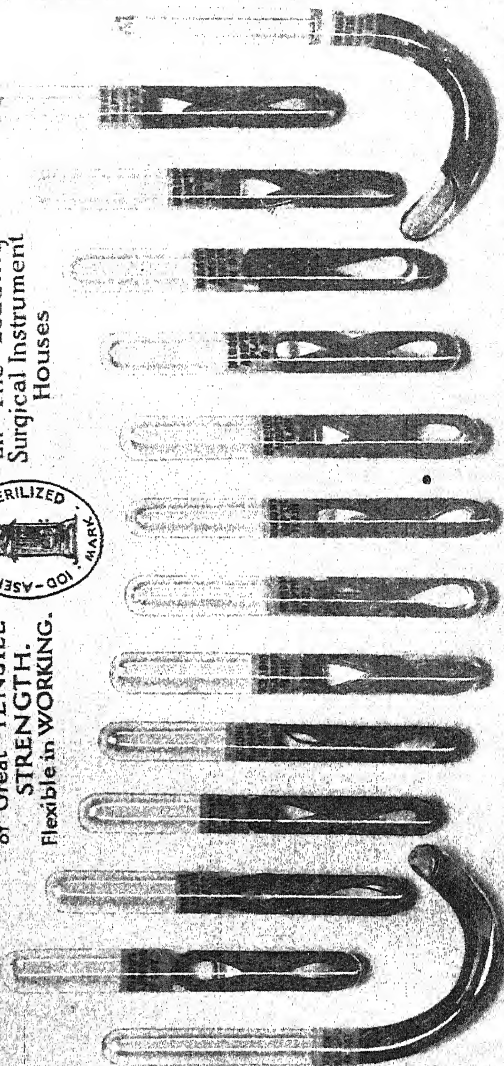
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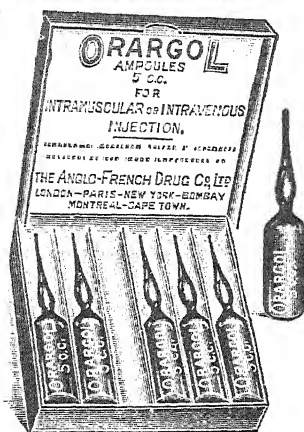
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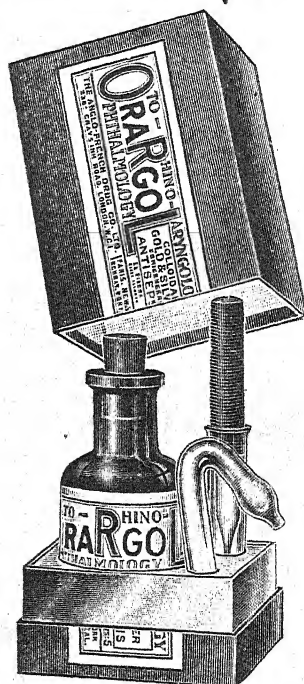
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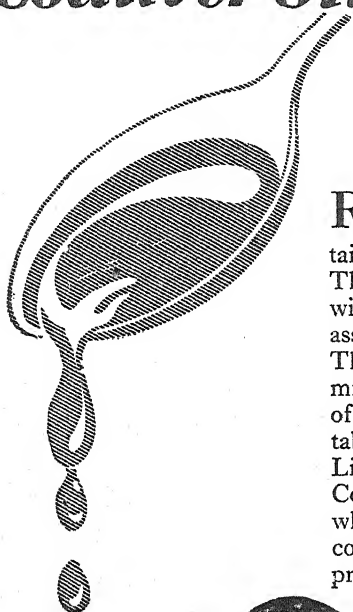
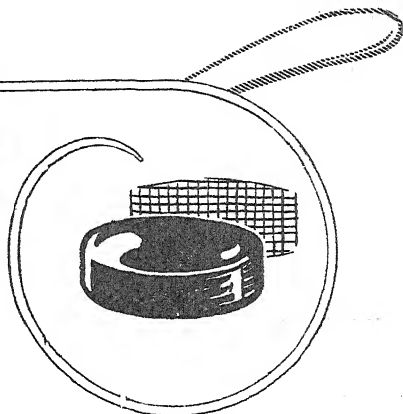
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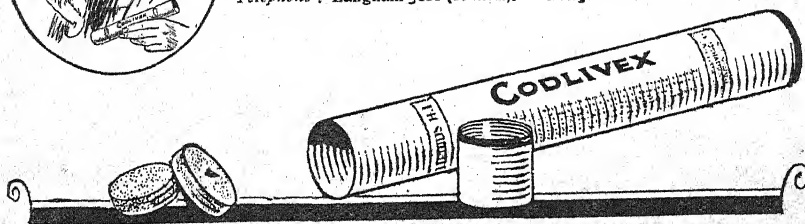
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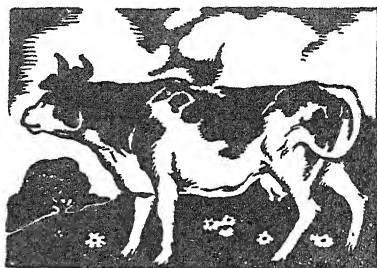
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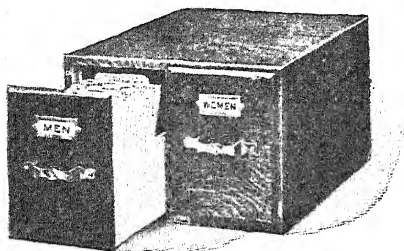
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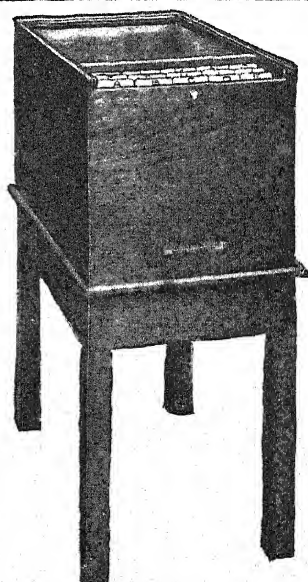
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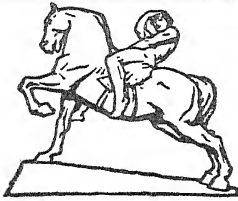
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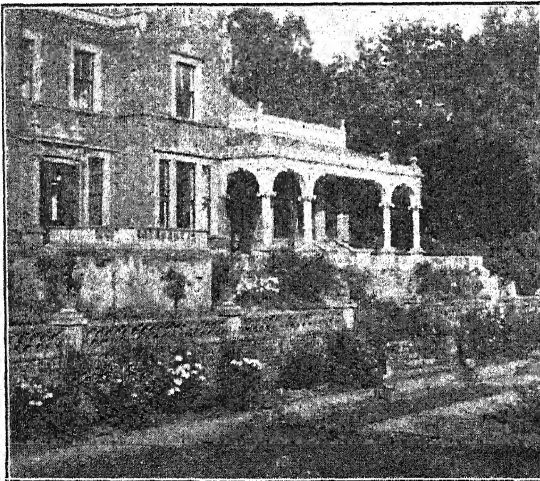
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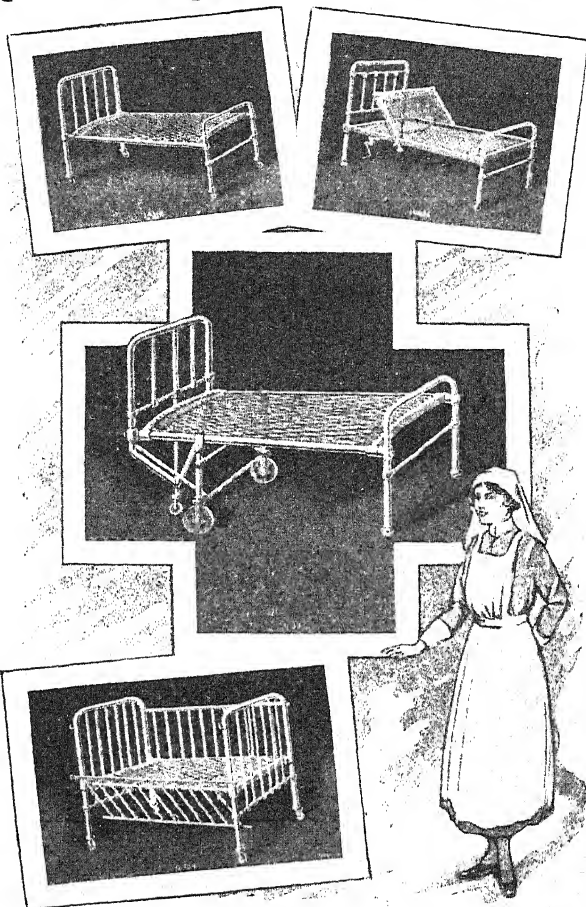
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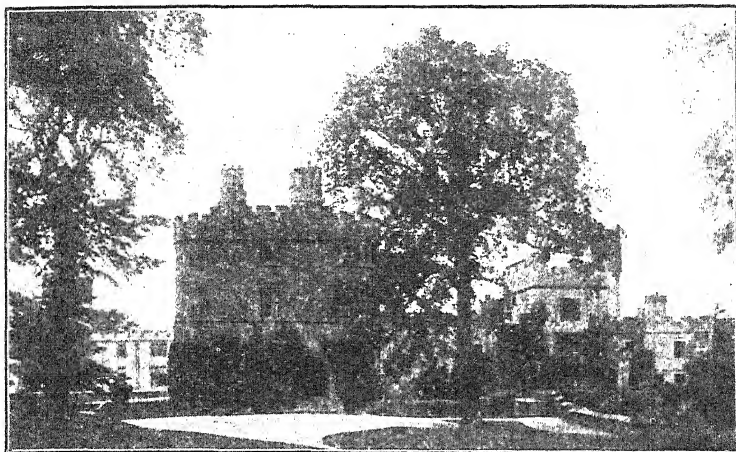
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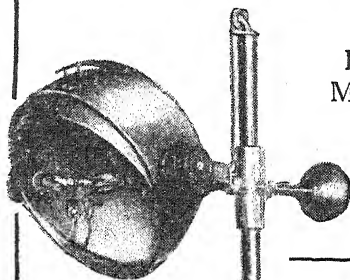
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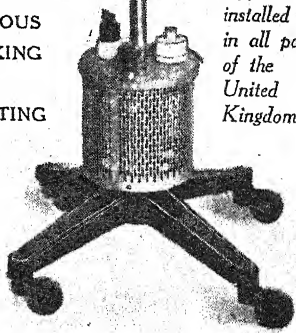
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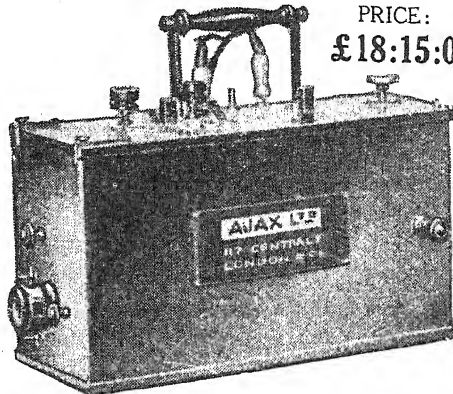
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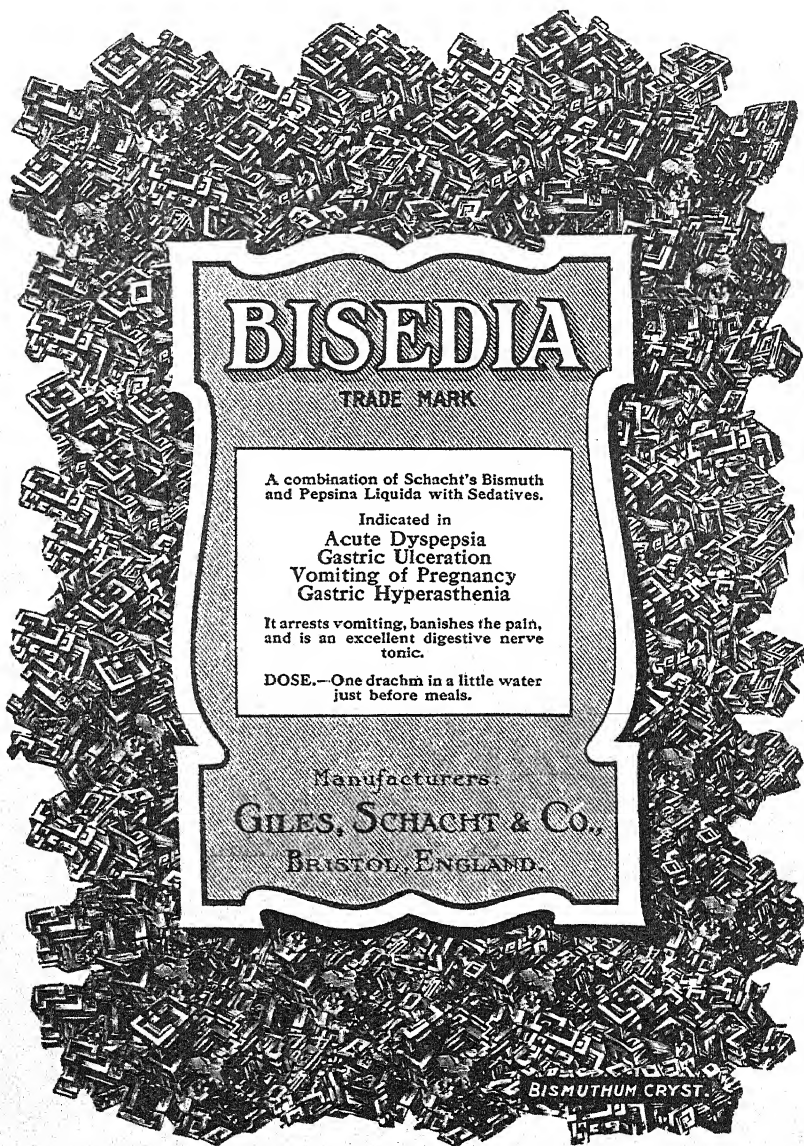


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It is encouraging both to the Editorial Staff and the Publishers to learn from letters received that their efforts are being increasingly appreciated at home and abroad.

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THE PUBLISHERS.

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THE MEDICAL ANNUAL, 1926

A Review of the Year's Work in the Treatment of Disease.

INTRODUCTION

BY THE EDITORS.

THE MEDICAL ANNUAL is essentially a practical book. Its object is to supply ammunition to the men in the firing line of the war against disease. Of this ammunition there are three chief kinds. In the Introduction we offer, not only a brief account of the general drift of the work published in the past year, but also some particular reference to improvements in these three kinds of attack on the enemy. First and foremost comes the provision of means for the successful treatment of the individual case. Second, as a necessary preliminary to that treatment, new methods of early diagnosis are continually under review. Finally, there are the broad principles of Preventive Medicine, which find each year some new application.

This prevention of disease is not so simple as it used to look. True, we still find scope in tropical countries for radical measures ; for example, this volume records work proving that certain sand-flies carry the protozoa of kala-azar, a discovery that should open a new door to preventive medicine. Another example is to be found in the authoritative article on food poisoning that this number presents ; detailed directions are given for the guidance of the practitioner who is confronted by an outbreak and wants to know how to get it investigated. But, for the most part, prophylaxis is now to be applied to predisposing rather than to exciting causes, at all events in our country. In this connection we commend to our readers articles on rheumatism and the common cold. In these unromantic sections of the front, familiarity has bred a certain contempt for enemies which are nevertheless formidable enough to deserve serious consideration. The prevention of mental deficiency, too, is discussed in a practical tone.

This volume tells of several brilliant advances in the medical treatment of disease. The first place must be given to Rogers' work on leprosy. Evidence accumulates from all the leprous areas of the world to show that this disease is far more amenable to treatment than was supposed, if the injection of ethyl esters of chaulmoogra oil be persisted with, under suitable conditions of diet and hygiene, and in suitable cases. The serum treatment of yellow fever, alluded to in recent

volumes of the ANNUAL, also receives support from facts recorded in this issue; it is further shown that prophylactic vaccine materially reduces the incidence of the disease. It is interesting to know that, in severe diphtheria with dangerous cardiac collapse, antitoxin can be safely and successfully injected into the peritoneal cavity.

Of the new drugs, one of the most promising is rutonal, which, we are told, does more for the epileptic even than luminal, to which it is related: the article on epilepsy furnishes a succinct review of our present attitude towards this disorder. The value of tryparsamide, only released for general use after careful testing at the Rockefeller Institute, is fully discussed. It appears that it may prove really helpful in the treatment of tabes and early general paralysis. Another of the newer drugs, mercurochrome, has been used intravenously for the treatment of general infections such as erysipelas and ulcerative endocarditis, experiments having shown that this method would be safe. The results are such as to encourage its further use, as well as a belief in the possibilities of oral administration.

To those who still find that 'the old is better' we commend the summary—in the article 'Heart Disease, General Therapeutics'—of Professor Cushny's new book on digitalis. There is no drug that can do more good, provided its use is limited to appropriate cases; but too often it is given either for inappropriate conditions, or in doses too small to excite a physiological response. The bogey of 'cumulative action', which is largely responsible for the second of these errors, is shown by clinical as well as laboratory experience to be nothing but a bogey. Adrenalin, we are told, may be of great value in the treatment of heart-block—a valuable hint in view of the intractable character of most cases.

The treatment of tuberculosis by sanocrysin is fully and critically discussed. The indications for its use are as yet so little understood that the dosage ought to be on the most cautious scale. Sodium morrhuate has proved disappointing. We have an interesting account of the spirochaetoses of the lung and their treatment by arsphenamin.

The article on diabetes reminds us that the discovery of insulin does not deliver either patient or physician from the tedium of dietetic treatment. Neither does it in any sense furnish us with a 'cure' for the disease. The fundamental lesion of the pancreas persists or tends to get worse, even while its harmful effects are being neutralized by the use of insulin.

In a paragraph on the treatment of chronic diarrhoea there is much of practical importance, including a discussion of the diagnosis and treatment of gastrogenic diarrhoea. We are reminded of the value of hydrochloric acid in this disorder.

The treatment of hæmorrhage in the newborn by injections of whole blood, either subcutaneously or into a vein, is described as "practically specific, and far superior to the use of serum". On the other hand, the value of blood transfusion in the treatment of pernicious anæmia is proving to be less than was at one time hoped, presumably because of the progressive nature of the underlying cause.

A small matter, perhaps, but so simple as to deserve attention, is the statement that thread-worms develop from ova only in the anal ring, so that if the anus is well washed after defæcation the worms will disappear.

Attention is drawn to increase in the incidence of infections of the central nervous system. The treatment of cerebrospinal fever by sub-occipital puncture is favourably commented on. Except for the possible value of intrathecal injection of serum from convalescents, advocated by Netter, we are still without any treatment capable of repairing the damage done by lethargic encephalitis, though belladonna or hyoseyamus may diminish the symptoms. On the other hand, the treatment of acute anterior poliomyelitis has become more effective. This is at all events incontestably true of the results achieved by early and prolonged immobilization: and to this, it is said, we are to add the beneficial influence of certain physical methods—X-ray applications to the spine, diathermy to the muscles, artificial sunlight to the whole body. Remedial measures of this kind—prolonged rest in airy and sunny surroundings—are required, not only for acute poliomyelitis, but also for the surgical tuberculosis and the cardiac rheumatism of childhood. The editor of our paragraphs on children's diseases bears eloquent testimony to the value of open-air treatment in this last affection. Rheumatic heart disease and its consequences furnish a problem about which both profession and public have been strangely apathetic, but there are signs of a more general awakening to its seriousness on the one hand and its tractability on the other. These prolonged courses of treatment cut so widely into the years of education that it is being found necessary to provide school hospitals, where the child may be taught and treated at the same time; and thus our idea of what a hospital should be is slowly expanding to include provision of ample fresh air and sunlight, with occupation. In this respect, as in the hints for treatment of insomnia by muscular relaxation, and of chronic alcoholism by 'weaning' methods (for which fifty per cent of enduring success is claimed), we may witness illustrations of the fact that the treatment of disease, if it is to succeed, must be based on the application of common sense, guided by a special knowledge of the problems that have to be solved. In so highly developed a task as this fight against disease there is always a great danger that special knowledge may tyrannize over common sense and fritter away the vigour of the campaign on ineffective details. In our natural interest in these details we must never let ourselves forget that we are servants maintained by the public to preserve or restore health as far as we can.

As we pass from the domain of medicine to that of surgery, we may note that the surgical treatment of angina pectoris is not making headway. Not only theory, but also practical experience, go to show that it is a mistake. On the other hand, from the authoritative article on the treatment of thyroid disease, we see that here surgery is finding a wider field of usefulness.

A new method is described for the collection of blood shed during an operation with a view to reintroducing it by transfusion. The new operative treatment of mitral stenosis is also discussed. Somewhat

detailed reviews are given of the modern treatment of fracture of the neck of the femur, and of the operation for pruritus ani, in which success so much depends on attention to an exact technique.

That bugbear of surgery, post-operative pneumonia, is considered; the present-day view is that non-descent of the diaphragm owing to reflex inhibition is an important factor in its production.

The use of an indwelling duodenal tube in cases of ileus, to drain out toxins and introduce fluids, is warmly advocated. There is a good article on the separation of genuine chronic appendicitis from the other commoner conditions which mimic it and lead to so much useless surgery. Reasons are given for avoiding resection in certain cases of diverticulitis and tuberculous cæcum, as cure may often be obtained by colostomy or short-circuiting. Cancer of the right colon lends itself to a one-stage operation; on the left side a two-stage is better.

Our reviewer in abdominal surgery says that we are apt to miss the main point in the ordinary hernia operation, in that we do not effectually close the internal ring. A good method is described of bringing down an undescended testis, by putting it through the scrotal septum.

Much activity is in evidence in neurological surgery, and quite a number of important new methods are reviewed, or old ones re-examined. These include a two-stage operation for cerebellar abscess, continuous drainage of the cisterna magna for meningitis, a treatment for glossopharyngeal neuralgia, and sympathectomy for Raynaud's disease. Rami-sectomy for spastic paralysis does not seem to have fulfilled its promise. There is a good account of the operative treatment of spastic torticollis, of the diagnosis of spinal-cord tumours, and of their mimicry by osteo-arthritis of the spine.

Ureteral stricture is being more and more recognized as a definite pathological condition. A good account will be found (partly under 'Bladder', partly under 'Kidney') of *B. coli* infections in both sexes. Figures for recurrence after renal calculus show 12 per cent after pyelolithotomy, 24 per cent after nephrolithotomy. Intravenous urotropine is being used to prevent or cure post-operative retention of urine. Reasons are given for preferring litholapaxy to lithotomy, in spite of the popularity of the latter. A good summary of the causes of hæmaturia is presented.

Another subject of very general interest passed in review is that of painful feet. There is also a critical review of the various treatments, surgical and otherwise, of senility, which have come so much to the public eye.

It is becoming common to advise opening the mastoid for acute otitis media if it does not quickly clear up. We present a discussion of the end-results of tonsillectomy, favourable on the whole; and also a critique of the 're-education method' in the relief of deafness.

In ophthalmology, the best methods of treating ophthalmia neonatorum are discussed; silver nitrate and mercuric perchloride have been abused, and eusol is recommended. The treatment of corneal ulcer is also described. Miners' nystagmus has been extensively discussed this year, and the view is defended that it is due not so much to posture or

bad illumination as to an infection. There is a description of the *early* eye signs of nephritis.

Old-fashioned practitioners will be glad to hear that there is a powerful case made out for a return to silver nitrate injections for the treatment of gonorrhœa, because in suitable strengths it penetrates best. It has been alleged that the introduction of salvarsan and its allies has increased the incidence of G.P.I. and tabes; this is examined and denied.

The X-ray treatment of malignant disease is considered at length. Further favourable reports are adduced of the X-ray treatment of pertussis.

The anæsthetists are writing much about the virtues of ethylene, which is described as the best anæsthetic for bad-risk patients. It needs to be used with care, as it is highly inflammable, but there have been deaths recently from the ignition of ether vapour also. A new local anæsthetic is under trial, called borocain, which appears to be anæsthetic to the urethra, while novocain is not. Splanchnic anæsthesia continues to arouse interest, but has to our knowledge been fatal sometimes.

Coming now to obstetrics and gynecology, we find a detailed report of an important discussion on the prevention of puerperal infection, which makes rather pessimistic reading. Interest has been excited by the new disease described under the name of endometrioma, in which epithelium from the endometrium forms a tumour engrafted on the pelvic organs, but its problems are by no means solved as yet. Further evidence is advanced as to the value of radium for cancer of the cervix. The symptoms and operative treatment of pelvic varicocele are described.

No doubt the outstanding event of the year in this country has been the work of Gye and Barnard on malignant growths, and the proofs they give that there are two factors at work—an organism, which can be demonstrated by a special microscopic technique, and a specific factor, probably chemical, developed within the living body.

In conclusion, we would like to remark on the improved attention given to methods of diagnosis. The search for means of early diagnosis has evolved two kinds of weapon. First, there is that which emerges from the accumulation of carefully tested clinical experience. For example, we are learning something new about the meaning of angina pectoris, as the article on coronary thrombosis shows. This knowledge, applied to individual cases, must result in a certain saving of life without inflicting any counterbalancing risks. Another example of the application of clinical experience to problems of diagnosis is to be found in the paragraph on abscess of the lung. This disease, we are told, is commoner in America than in Britain. In almost one-third of the cases, the abscess develops after some operation on the upper respiratory tract. Five cardinal indications for diagnosis are described.

The other kind of diagnostic weapon is double-edged. Clinics are springing up in which the patient may be given what can only be described as a tremendous overhauling by team-work. New diagnostic methods are being evolved, several of which receive special notice in

this number. Among these are cœlioscopy, or inspection of the abdominal viscera with the cystoscope after air-inflation of the peritoneal cavity; lipiodol for the X-ray diagnosis of spinal-cord tumours; and cholecystography for the X-ray demonstration of gall-bladder disease. Other new methods, described in previous years, are also being used, which, like the above, require expert handling. This is all to the good, and it is one of our principal aims to bring new diagnostics to the notice of our readers. Yet we feel it our duty to utter a word of caution. The reserve with which our reviewer speaks of lipiodol has since been justified. Several cases are known to us in which grave paralytic symptoms have followed after an interval.* The injection for cholecystography has to our knowledge been instantly fatal. Methods in which there is an element of danger should only be used for diagnosis (we are not speaking of treatment) when they are seriously needed; there can be no manner of excuse for endangering a patient's life when a diagnosis can be made by simpler means. So far as the MEDICAL ANNUAL has any influence, we are resolved that it shall be exerted in the direction of sanity. In this connection we may quote the closing lines of a recent paper† by Sir Humphry Rolleston: "Careful history-taking and a thorough physical examination, with the exhibition of a due proportion of clinical acumen and common sense, will, on the whole, serve the practitioner better than much laboratory lore. But the ideal is a critical judgement founded on the combined information supplied by the two methods, each serving as a supplement and check to the other".

* E.g., Maclaire, *Amer. Jour. Med. Sci.*, 1925, Dec., 874.

† *Practitioner*, 1926, Jan.

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

ABDOMINAL SURGERY, MISCELLANEOUS.

*E. Wyllys Andrews, M.D., F.A.C.S.**Edmund Andrews, M.D., F.A.C.S.*

Crile,¹ in discussing complications of abdominal operations, describes a method of treating *hæmorrhage* which, although quite contrary to the usually-accepted tenets, has a much more rational basis. He says that the defence of the body against internal hæmorrhage is the usual picture of shock. Falling blood-pressure and collapse should be hastened, not combated. The extremities are bound with tourniquets tight enough to shut off the venous but not the arterial circulation. By this means much of the blood is sequestered in the limbs. The patient is sat upright in bed and no stimulation given. By this means the blood-pressure is rapidly lowered to the fainting point, and thus the bleeding point is given the opportunity to close itself by a clot.

C. P. Brown and W. L. Brown² report very good results in the use of the *duodenal tube in peritonitis and post-operative distention*. The smaller calibre of this tube facilitates its introduction, and it may be left in place for days at a time with little distress to the patient. In some few cases the tip remains in the stomach, but generally it can be demonstrated by the fluoroscope that it passes the pylorus after a few hours. In such cases the pylorus is as a rule wide open. The advantages of this method are numerous. Most important of all, it enables one to drain the duodenum and upper jejunum, the area where the toxins are elaborated. The experimental studies of many workers have now rendered it clear that in peritonitis, as well as obstruction, the toxæmia arises from products elaborated in the mucosa of this upper intestine. Constant or intermittent lavage is possible with the tube in this position, and no distress is caused the patient. Nausea ceases. Food and drink can often be absorbed from the bowel which would never reach it if ingested. Not only can the toxins be washed out, but the dehydration, which is such an evident feature of these cases, can be successfully combated by the introduction of very large amounts of fluids through the tube. The value of this measure for the relief of tension on sutures in the stomach or upper intestinal tract is considerable. The presence of the tube does not preclude the swallowing of materials in the natural way, and the tolerance of the stomach can be tested out by this means before the tube is removed.

R. H. Martzloff³ has studied the *post-operative course* of 162 patients, every alternate one of whom was treated with Eserine. His cases received $\frac{1}{100}$ gr. eserine every four hours for eight doses after operation. His conclusions are that this drug is of little or no value in this condition, and that its use should be abandoned. It is unwise to conclude that it will have the same action on diseased bowel as it has on normal bowel. H. E. Martin and S. Weiss⁴ made a similar study on a much smaller series of cases, using very much larger doses, and report quite different results. They are agreed with Martzloff that doses he used had no effects. The smallest individual dose having any effect was $\frac{1}{16}$ gr., and it was often necessary to give as much as $\frac{1}{8}$ gr. in four hours in order to bring about a passage of the flatus. These latter observers divided their

cases into two types, toxic and non-toxic, and report that the drug is of marked benefit in the non-toxic cases but seems to have no action in the others.

W. J. Mayo⁵ is convinced that surgery should play a great part in the treatment of *hepatic cirrhosis*. At his clinic there have been 47 omentopexies performed. Of these, 7 died before leaving the hospital. When it is realized that the operation was as a rule undertaken on very severe cases, often with generalized oedema and in advanced stages of cardiac failure, it seems that the results amply justify the risk. Several of the deaths included were not directly due to the operation. Most of those who recovered were cured; that is, they were cured as far as the ascites was concerned. The technique used was a short incision through the upper right rectus muscle, going into the abdomen. Then, in the lower part, below the umbilicus, another incision was made down through the muscle only. Into this pocket the omentum is pulled. The amount of collateral circulation thus established is surprising. He once had occasion to make an incision later in a near-by area, and had to desist on account of the enormous vascularity. In the earlier cases drainage was left in, which resulted in some deaths from peritonitis. It is the practice now to attempt to empty the belly by tapping first, and to keep it empty for a period after the operation by this means until the wound is healed and the collateral circulation has begun to develop. Splenectomy has also been done in a number of cases. If the spleen is large, as in the portal type of cirrhosis, marked benefit will be derived from this procedure. In biliary cirrhosis the spleen is not usually involved to such an extent, and splenectomy is not indicated. In selecting cases suitable for this operation it is important to note that those showing a liver function of 25 per cent or less by dye tests are almost never able to withstand the shock of a laparotomy, and should be rigidly excluded.

C. G. Heyd, W. J. MacNeal, and J. A. Killian⁶ have added materially to our knowledge of *hepatitis*. After making sections of excised bits of liver secured in various abdominal conditions, they arrived at the conclusion that in a great many cases the secondary effects on the liver-cells were of great importance. In even the milder catarrhal cases of appendicitis and cholecystitis there is a gross enlargement of the liver. On microscopic section such livers show marked evidence of degeneration. In chronic cases there is a round-cell infiltration between the liver-cells, and also beneath the capsule, which often gives rise to adhesions. In the more acute type, leucocytic infiltration is seen. The liver-cells are distorted and vacuolated or even disintegrated. There is, finally, an increase in connective tissue constricting the branches of the portal veins and the smaller bile-ducts. The clinical significance of these facts is great. First, it is likely that a great many of the deaths following abdominal operations are due to this cause. These cases can be identified by exclusion only in the present state of our knowledge, but it is clearly recognized that death frequently occurs in the absence of any demonstrable lesion such as peritonitis or embolus. Also, it seems very likely that in many cases the surgeon removes the focus at operation, but the hepatic condition persists, causing the same symptoms, and we may thus be led to believe that the diagnosis was wrong.

REFERENCES.—¹*Ann. of Surg.* 1925, Jan. 25, 326; ²*Jour. Amer. Med. Assoc.* 1924, Aug. 9, 419; ³*Johns Hop. Hosp. Bull.* 1924, Nov., 370; ⁴*Jour. Amer. Med. Assoc.* 1925, May 9, 1407; ⁵*Ann. of Surg.* 1924, Sept., 419 ⁶*Amer. Jour. Obst. and Gyn.* 1924 vii, April, 413.

ABORTION.

W. E. Fothergill, M.D.

Readers in this country have been surprised during recent years at the extreme conservatism of modern American authorities in treating abortion. We have been told that septic cases should never be treated actively, and that

intra-uterine manipulation of any kind is decidedly contra-indicated by a temperature of more than 101° . Severe hæmorrhage was the only excuse for emptying the uterus of retained products of conception. One writer analysed 1640 cases of abortion in which the uterus was emptied by curette in only 3 per cent. There were 193 septic cases, and it is not surprising to learn that 72 of them died. Now the tide seems to have turned, and there is a reversion to the classical modes of treatment. H. K. Tuttle¹ has studied 1164 cases treated at the Ancon Hospital, where it has been the policy to empty the uterus by operative procedure in all cases of abortion when membranes and placental tissue remain in the uterus. The writer concludes that, in the ordinary incomplete abortion, the sooner the uterus is emptied the shorter will be the convalescence. In septic cases he considers that when the infection has spread beyond the uterus and there is no retained necrotic tissue in the uterus, treatment should be expectant; but when such tissue remains in the uterus it is essential to remove it. These opinions are arrived at after a very elaborate analysis of the 1164 cases which cannot be abstracted briefly. They seem to be those generally held before the recent reaction against the removal of retained products of conception was inaugurated a few years ago. So we shall soon be where we were on this question.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1925, Jan., 87.

ABSCESS OF BRAIN. (See BRAIN, ABSCESS OF.)

ACIDOSIS, POST-OPERATIVE, IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

P. C. Jeans and K. H. Tallerman¹ have studied afresh this difficult problem. They find that the acetone bodies are by no means sufficient to cause the lowering of the alkali reserve. They are unable to identify the factor responsible, but their work excludes either lactic acid accumulation or phosphate retention. Their conclusions are given as follows: "We have found the lowering of the alkali reserve to be due in but small measure to acetone bodies, or to lactic acid accumulation. Phosphate retention is obviously not the cause of any acidosis that may exist. In fact, phosphate excretion constitutes a compensatory mechanism, the phosphates of the blood falling with a lowered alkali reserve, and the phosphate excretion being increased coincidentally. The organic acids excreted increased, and, in those instances showing a more marked lowering of the blood CO_2 , were in excess of both acetone bodies and lactic acid. It is therefore presumed that some as yet unidentified factor is largely responsible for the lowered alkali reserve which is observed. The fall of the CO_2 appeared proportional to the drop in blood-pressure. It was observed also that qualitative tests for acetone bodies in the urine gave but a poor indication of the degree of acidosis present, if compared to the variation in alkali reserve".

REFERENCE.—¹*Brit. Jour. Child. Dis.* 1924, 268.

ACNE VARIOLIFORMIS.

E. Graham Little, M.P., M.D., F.R.C.P.

M. M. Strumia¹ has observed two cases of acne varioliformis. The first was in an Italian boy of 18, in whom the disease was said to have begun between the age of five and ten, after an attack of small-pox. When seen by the author there were large numbers of active lesions, distributed over all the body, except the scalp, hands, forearms, and feet. The lesions began with deep-seated nodular infiltrations; exhibiting, later, central necrosis and ulcers with hard steep margins and a broad hæmorrhagic areola; scars were numerous. Over the face and upper part of the trunk they were definitely

varioliiform. The lesions had no relation to the hair follicles. The Wassermann was negative; the blood-count normal. Cultures were taken from the nasal secretion and tonsillar crypts; fluid from a fresh lesion; pus from an open lesion, and pus from a small superficial yellow pustule. From the fresh lesion, *Streptococcus pyogenes hamolyticus* and *Staphylococcus pyogenes aureus hamolyticus* were obtained. The same organisms grew from the old lesion, and from the nose and throat cultures. From the yellow pustule, *Staphylococcus aureus* alone grew. Animal experiments were undertaken which support the hypothesis, which has been previously suggested, that acne varioliformis is produced by a combination of staphylococcus and streptococcus, neither of which, by itself, produces the same result.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Dec., 702.

ACNITIS.

E. Graham Little, M.P., M.D., F.R.C.P.

J. F. Schamberg and M. J. Harkins¹ have studied very thoroughly a case of acnitis in a female nurse, age 20, who showed reddish macules, papules, and nodules upon the chin and cheek (*Plate I*), later upon the forehead and upper part of the face. The lesions usually suppurated and healed, leaving pitted scars. Histological sections showed diffuse cell infiltrations, with many giant cells, but no bacterial organisms. Smears showed the presence of staphylococci and a Gram-negative rod-shaped organism, which the authors labelled '*Bacillus x*', and which was found to belong to the colon group. The same organism was found, with two others, in an anaerobic culture, but not in the aerobic experiments. An emulsion of an excised nodule injected into guinea-pigs produced, in one animal, a generalized pustulo-crustaceous eruption, followed by ulceration; and '*Bacillus x*' was recovered in culture from the cutaneous lesions, and from the peritoneum and heart blood of this guinea-pig. Intraperitoneal and intravenous injections of a culture of '*Bacillus x*' failed to produce an eruption in guinea-pigs, although the organism caused death, both of guinea-pigs and rabbits. Animal experiments were negative for tubercle. Cultures on hormone broth plus 0.1 per cent glucose and brain tissue pH 7.2 grew aerobically and anaerobically.

REFERENCE.—¹*Arch. of Dermatol. and Syph.*, 1925, March, 339.

ADDISON'S ANÆMIA. (See ANÆMIA, PERNICIOUS.)

ADDISON'S DISEASE.

Ivor J. Davies, M.D.

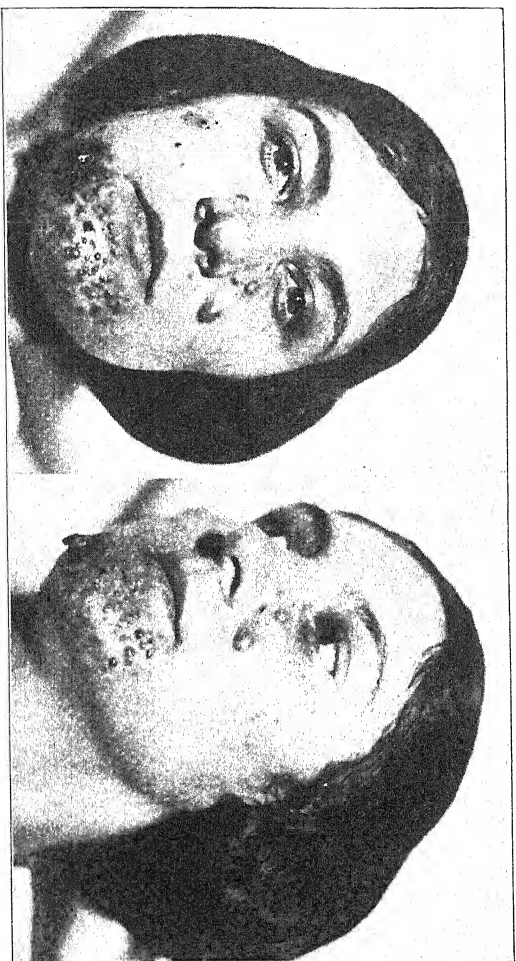
J. J. Conybeare and G. C. Millis¹ publish their observations on 29 cases of Addison's disease at Guy's Hospital between 1904 and 1923. They refer to Addison's² original communication of an account of 11 cases in 1855, and to Wilks's³ series of 33 collected cases in 1865. The present series is the third only from Guy's, for no other appeared in the intervening years, and this fact supports their view that Addison was hardly justified in his belief that the disease would be found to be relatively common.

Their series of 29 cases was made up of 20 males and 9 females. Death took place in over half the cases between the ages of 20 and 40. Two were under 10 years of age, and none over 60. These facts agree with those found in other collected statistics. Post mortem, fibro-caseous tuberculosis of the suprarenals was found in 22, or 76 per cent, and simple atrophy in 7, or 24 per cent. In the former group tuberculous lesions were found elsewhere in all but 4 cases; whereas in the latter or atrophic group no tuberculous lesions were found, except for old scars in the lungs in two of the cases.

SYMPTOMATOLOGY.—In the tuberculous group the average duration in the large majority was a little over four months. In three only had symptoms

PLATE I.

ACNITIS



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been present for more than one year before death, and not one had lived more than two years. The other group was in marked contrast, for, of the 7 cases, one had shown symptoms for ten years, one for five years, and 2 for over a year; the remaining 3 cases were of nine, four, and three months' duration respectively, but in one death was probably accelerated by an acute infection.

They say that in all probability symptoms do not manifest themselves until the glands are largely destroyed, and thus explain the absence of any evidence of Addison's disease in cases of growths of the suprarenals. Pigmentation was present in all but 2 of the cases, but 8 showed no buccal pigmentation, while in 2 pigmentation was only found in the mouth. [In a recent case of the reviewer's, pigmentation of the face was so marked that the patient was almost unrecognizable in a few weeks, and the predilection of pigmentation for exposed parts was well shown in the hands, for the dorsum was affected far more than the palm, as in the coloured races.—I. J. D.]

Asthenia was a constant symptom from the onset. Gastro-intestinal symptoms, generally in the form of vomiting, although common, usually occurred shortly before death. Fractional test meals in four cases merely showed some degree of hypochlorhydria. In most of the patients there was no evidence of severe anaemia, whereas Addison laid stress on the prominence of this sign. Blood examinations were done in 5 cases only, and in none was the haemoglobin below 50 per cent. Low systolic blood-pressures were frequent, the lowest being 40, and in two only was a reading of over 100 mm. recorded.

TREATMENT.—**Adrenalin or Suprarenal Extract** was tried in most cases, the former being given either by the mouth or by injections. No definite improvement resulted, and in several cases adrenalin when given by the mouth aggravated the vomiting. In one case a foetal suprarenal gland was grafted into the testicle, but death took place twelve hours later; and in another a similar graft was placed in the kidney, but again with a fatal result almost immediately. Two others died shortly after dental extraction and tonsillectomy respectively. Conybeare and Millis conclude this section of their paper by stating: "It would thus appear that the risks of operation are extremely great in any patient suffering from Addison's disease, and it is doubtful whether any attempt at grafting can be regarded as justifiable, particularly as there is no experimental evidence of the viability of a homologous suprarenal graft."

DIAGNOSIS.—This is never certain until confirmed by autopsy, for the authors affirm that no single symptom can be regarded as diagnostic of the affection. They mention cases of pigmentation from chronic intestinal intoxications, and derived in other cases from non-European ancestors. The low blood-pressure, even, is not diagnostic in itself. They cite an investigation in conjunction with Osman of the systolic blood-pressure in 108 patients in the medical wards of Guy's Hospital suffering from various chronic diseases. A reading below 100 mm. was found in no less than 28 cases, the lowest readings being between 70 and 80 mm. in patients who were certainly not suffering from Addison's disease. Asthenia also is a common symptom of other conditions, and is almost as marked in the other disease now known by the name of the distinguished Guy's physician, viz., Addison's anaemia. [The fairly rapid development of acute asthenia with pigmentation, the periodical gastrointestinal disturbance and more especially vomiting, and a steady progress towards a fatal termination, constitute as a rule an almost typical clinical picture.—I. J. D.]

The authors conclude an interesting and valuable paper with a description of two cases illustrating an occasional difficulty in diagnosis. One was a case of cirrhosis of the liver with marked pigmentation and anaemia. A diagnosis of Addison's disease was made, and two suprarenal grafts were inserted at

different times. No evidence of Addison's disease was found after death. This case was shown at the Clinical Section of the Royal Society of Medicine⁴ in 1922. The other was a case of Addison's anæmia and phthisis with marked pigmentation in which an early diagnosis of Addison's disease was made, but at the post-mortem no microscopical changes were found in the gland.

REFERENCES.—¹*Guy's Hosp. Rep.* 1924, Oct., 369; ²*On the Constitutional and Local Effects of Disease of the Suprarenal Capsules*, London, 1855; ³*Guy's Hosp. Rep.* 3rd ser. 1865, xi, 23; ⁴*Proc. Roy. Soc. Med.* (Clin. Sect.), 1922, xv, 19.

ADENOMYOMA. (See ENDOMETRIOMA.)

ALCOHOLISM AND DRUG ADDICTION. Henry Devine, M.D., F.R.C.P.

The Social Aspect of the Alcohol Problem.—Sir Arthur Newsholme,¹ writing on this subject, states that the amount spent on drink in Great Britain in 1923 was equal to the total interest on the National Debt; was more than the aggregate amount spent on Imperial defence, education, and national health, including unemployment insurance; four times as much as was spent on war pensions; and more than four times as much as the aggregate amount spent on the relief of the poor and on old age pensions. In spite of these facts, however, he shows that the drink evil is diminishing, and that between 1899 and 1922 the *per capita* consumption of beer in the United Kingdom has declined from 32.53 to 15.80 gallons. Corresponding with these changes the convictions for drunkenness in England and Wales declined from 161,407 in 1910 to 76,347 in 1922. This improvement is in part the result of educational enlightenment, associated with restrictive measures directed especially to the limitation of the sale of alcoholic drinks. In spite of these encouraging figures, Newsholme is of the opinion that further restrictive measures are urgently necessary, as the evidence that the national evil of alcoholism is still terribly great is overwhelming. He points out that the effect of alcohol on character is always in the direction of reducing the inhibitions against antisocial conduct, and emphasizes particularly the intimate relationships between alcohol and venereal disease, crime, poverty, and infant mortality. He stresses the value of medical guidance in expediting the reduction of the drink evil, and suggests that medical action directed towards the following ends is needed: Alcoholic drinks between meals should be forbidden; strong medical opinion should be given on the special evil resulting from indulgence in spirits and the stronger beers and wines; the evil of frequently repeated alcoholic drinks should be emphasized; and the utmost care should be exercised to avoid the possibility of the temporary prescription of alcohol becoming the starting-point of an alcohol habit. In conclusion, he urges that it is only by increased compulsion in the form of restriction on the sale of alcoholic drinks, backed by the hygienic persuasion of physicians and others, that we can secure reduction more rapidly than at present of the alcoholism which is still a chief cause of crime, disease, destitution, and neglect and impoverishment of families in our midst.

The Treatment of Alcoholism.—F. Hare² gives a useful outline of his methods. Patients abstaining on admission, or who have finished their tapering process, are placed upon a tonic of *Cinchona* and *Gentian*, together with hypodermic injections consisting of mixed solutions of *Strychnine Nitrate* (gr. iv ad ʒj) and *Atropine Sulphate* (gr. j ad ʒj). During the first week there is a gradual rise from the minimum of 2 min. of the strychnine solution and 1 min. of the atropine up to 5 min. of the former and 4 of the latter. This is maintained for three or four weeks or more. After this there is a gradual reduction, which varies in duration, down to 2 min. and 1 min., as at first, upon the day of leaving. In those cases which are not abstaining on admission, tapering is essential, in order to avoid the development of delirium tremens. Preventive

treatment of this condition may be regarded as the curative treatment of acquired tolerance of alcohol. Having determined the amount of alcohol required to keep the patient comfortable, tapering should be commenced. This should be cautious: the first reduction should never exceed three fluid ounces; the second should not much exceed the first; the third may be a little larger. The dosage should be regular and uniform, and well diluted. The tapering need rarely occupy more than ten days. As regard drugs, **Sodium Bromide** in half-drachm doses is advisable, but hypnotics other than alcohol are not usually required when the tapering method is adopted. **Apomorphine**, used hypodermically, is probably the most useful single drug in the therapeutics of alcoholism, and in some other drug habits, such as morphinism. It is advised in the following circumstances: in maniacal or hysterical drunkenness (*mania à potu*); during the premonitory stage of dipsomania or during the paroxysm; and during several kinds of insomnia, especially perhaps that which occurs in morphinism or after the drug has been tapered off. Given in full doses the drug is always strongly emetic, but the vomiting is short-lived. The hypnotic effect is no less certain and hardly less rapid. Apomorphine has the advantages over other hypnotics that it is free from the danger of setting up any craving, and does not interfere with the power of natural sleep. As regards the duration of treatment, it is found that the craving for alcohol ceases in three or four days after the patient has finished his tapering course, but in spite of the patient's claim that he is well and fit to work, with certain exceptions, it is essential that patients should remain continuously in the sanatorium for six or eight weeks; earlier discharge will make relapses probable. The term 'cure' is used in an extremely diverse sense, and in giving the results of treatment Hare avoids all qualifying terms, and divides past patients into two classes, namely: (1) Those who are still abstaining at the date of the last information; and (2) Those who had relapsed at a certain date. After omitting the drug cases, those who were not fully treated, and some who were lost sight of, the results of treatment in 695 cases were as follows: Cases known to have relapsed, 287, or 41.3 per cent; cases stated to be only improved, 22, or 3.16 per cent; cases who remained abstainers when last reported on, 386, or 55.53 per cent.

S. Park³ has not found the McBride method, employing atropine and strychnine, altogether satisfactory in its results in the treatment of inebriety and drug habits. He advocates **Strychnine**, $\frac{1}{16}$ gr. twice daily; **Colloidal Gold** (sterules), 1 c.c. three times daily; and **Calc. Glycerophos.**, 2 gr. in 3 c.c., 1.5 c.c. once daily. Given by the mouth, **Nux Vomica**, **Cinchona**, **Kola**, **Damiana**, and **Gentian** have all been found useful. **Catha** (5-gr. tablets, Martindale's ext.) he finds removes the craving for alcohol and morphine and the depression attending their use. He regards institutional treatment as essential.

D. M. Paton⁴ regards emetine as a specific for the alcohol craving. His usual routine is to give an injection of $\frac{1}{2}$ gr. of **Emetine Hydrochloride** every second day for three doses. In some cases it may be found advisable to give one every day for three doses. After the first three the interval between succeeding doses is lengthened by a day. Thus, injections are usually given on days 1, 3, 5, 8, 12, 17, 23, 30. This usually constitutes a course, although an injection once a week may be given for some time afterwards if thought advisable.

The Treatment of Morphinism.—This is a matter of extreme difficulty, owing to the severity of the abstinence symptoms; patients are often reduced to a state of physical and mental collapse, and have the feeling that morphia is the only 'tonic' which will restore them to their normal mental and physical level. O. Wuth⁵ points out that the usual sedative drugs do not allay the

symptoms, but merely add to them a feeling of stupefaction. Chloral hydrate is especially to be avoided, as it is often found to have a paradoxical action and produces states of excitement; scopolamine and atropine are also not to be recommended, and should only be given if sweating, salivation, and motor unrest predominate, and for this they are often unsuccessful. **Antipyretics, Baths, Fresh Air, Venesection, and Protein Shock Therapy** have given good results; and various **Endocrine Products** should be tried with due consideration of the individual's special modes of reaction, while the general narcotization of the autonomic system by antipyretics or by small doses of **Morphia** during gradual withdrawal should not be neglected. R. v. Hösslin⁶ recommends gradual withdrawal, and gives three doses a day at the start, reducing the night dose last. He advocates giving large doses of **Sodium Luminal** subcutaneously, so as to tide the patient over the abstinence symptoms by keeping him in a state of twilight sleep, and also gives **Camphor** and **Caffeine** injections to overcome the feeling of prostration. He considers that treatment can only be satisfactorily carried out in a 'closed' institution, and emphasizes the cunning of the habitué in hiding supplies or procuring them in disguised form. A difficulty in the treatment is the legal one that patients cannot be detained for cure against their will for a sufficient time to reduce to a minimum the risk of relapse, and for this reason he is in favour of compulsory legislation for the treatment of drug cases.

The Relationship of Mental Abnormality to Alcohol and Drug Addiction.—Most writers consider that the greater number of habitués have drifted into narcotism because of inherent mental instability; the majority of addicts, also, become victims during adolescence, before character, even in normal youth, can have become stabilized. The same holds good in many alcohol addicts, and Sir P. Stewart⁷ states that careful inquiry into the history of dipsomaniacs shows that many of them have a marked neuropathic heredity, and that practically all, before they happen to acquire the habit of paroxysmal excessive drinking, have exhibited such morbid symptoms as phobias, obsessions, depression, visceral discomfort, etc. Sir F. W. Mott⁸ points out that the effects of alcohol on the character are, also, much more pronounced in the subjects of inherent instability. The potential psychotic—the individual with inborn instability—is, as a general rule, unable to become a drunkard owing to the fact that his highest evolutionary level of the brain is easily narcotized by small quantities of alcohol, causing him to break down mentally. It follows, therefore, that in the majority of cases admitted to asylums, alcohol has only been a contributory factor and not the essential cause. What is moderation in the normal person may be excess in the case of the mental defective, neurasthenic, or potential psychotic. E. Herzig,⁹ in a general survey of the cases admitted with psychoses associated with drug poisoning to the city asylum of Vienna, discusses the effects of drugs and an underlying psychotic tendency. As is found in alcoholic psychoses, many of his patients showed symptoms suggestive of dementia præcox, but these cleared up when the effects of the drug had disappeared, though the regained normal state was one of emotional instability. Evidence of a pre-existing psychopathic personality was found in all his cases, except where the habit was formed late in life, following physical or mental stress.

The Relationship of Cocainism and Homosexuality.—H. Hartmann,¹⁰ in a discussion of this question, bases his views on the study of cases at the Wagner-Jauregg Clinic. All entered voluntarily or were brought by the police for psychotic manifestations; many were in a state of delirium. All were suddenly deprived of their drug after taking from 2 to 10 grm. daily, no ill-effects being produced by the sudden withdrawal—a result, noted by other observers,

contrasting strikingly with the severity of the symptoms occurring in morphia deprivation. He observes that it is difficult to gain the confidence of these patients, who tend to be suspicious, and who are also very suggestible; hence leading questions were carefully avoided, and the discussion of their sexual life was only undertaken when their confidence had been gained. For these reasons he is of the opinion that his high proportion of positive findings of homosexuality is, if anything, probably lower than the real one. Of his 12 female and 8 male cases, 7 women and 4 men were manifest homosexuals; of the remaining 9, only 3 stated that cocaine did not affect their sexual life, while the rest had lost or had never felt heterosexual desire and satisfaction, and 3 had perverse leanings while taking cocaine (viewing, sadism, etc.). In some cases manifest perversions or homosexuality had existed before taking cocaine; in others, a definite change in these directions had occurred under the influence of the drug, either during intoxication with it or since it had become a habit. A few retained heterosexual feeling and potency; most did not. The patients had for the most part lived among circles where drug taking was usual, and reported that a great proportion of cocaine habitués were also inverters or perverts. Hartmann regards it as probable that here, just as has been described in alcoholism, there is from the start an unusually strong proportion of homosexuality in the individual disposition, giving both a special vulnerability of the normal heterosexual trends to the action of the drug, on the one hand, and a special disposition to seek the pleasure or relief given by the drug, on the other.

The Effects of Morphine on the Physical Organism.—In addition to the study of personality and antecedents in drug addicts, the study of the effects of the toxins on the organism is one of great psychiatric interest, since we are here dealing with a manifest correlation between biological changes in the organism and profound changes in character, which sometimes assume psychotic form and intensity. C. C. Wholey¹¹ points out that we find morphine acting conspicuously on the vegetative or involuntary nervous system, with its endocrine extensions. The cardiovascular system of an habitué soon adjusts itself to the support of an opiate. Morphine is a powerful stimulant of this system. The digestive apparatus also is controlled by the vegetative nervous system, and here, in the addict, the organism adjusts itself to the obtunding changes imposed on the secretory and smooth-muscle-fibre-nerve mechanisms by the drug. Under the drug, constipation is almost universal; on withdrawal, an irritation is produced by the sudden exposure of the drug-obtunded neurosecretory mechanism to the demands of former normal functioning. A temporary over-activity is brought about, resulting in diarrhoea, cramps, vomiting, and general abdominal distress. Similar changes occur in the reproductive organs. Cessation of menstruation occurs in the female, accompanied by more or less complete loss of sexual desire. In the male, complete sexual impotence is frequently seen. On withdrawal of the drug, the individual is often overwhelmed by tumultuous sexual desire, and it is of frequent occurrence for male addicts to be greatly concerned over seminal losses, and sexual erethism, at the end of withdrawal. When the physiological functions are so interfered with, it is not surprising, as Wholey points out, that mental and emotional distortions should occur. The disturbance of the instinct of sex naturally leads to a disappearance of those incentives grouping themselves about the family unit—ambitions, affections, and the desire for social esteem. In general, the addict becomes timid, fearful, secretive, and asocial. Just as the cardiovascular system in an habitué adjusts itself to the physiological support of an opiate, so in the character realm the habitué adjusts himself psychically to the support of the drug; he finds in it an agent that

artificially fortifies him for meeting pain and difficulties. In order to maintain his so-called drug balance, or state of satisfaction, he must continually increase his supporting drug. He is playing a losing game by the necessity of compensating artificially against the weakening of character that inevitably results from the removal of the necessity of meeting obligations and exigencies through the discipline of effort. The normal appetites and hungers by which the organism makes known its needs are to a degree neutralized. The cycles of hunger and appeasement, of wakefulness and sleep, of work and rest, are broken in their natural sequence, and cease to guide the individual along self-preservative lines. He may be chronically exhausted, but realization of the fact may be shut off, and therefore unheeded. The drug has the effect of lulling the victim into a sense of security out of keeping with facts. The future holds no menace; he plans confidently for impossible undertakings, though in imminent danger of death from some obvious organic disease.

The Cure of Maladies associated with Morphinomania by Rapid De-intoxication.—P. Sollier and D. Morat,¹² in an interesting article, state that they have found that the reactions set up by demorphinization often exert a favourable influence upon other diseases, which in some cases preceded the drug habit and were responsible for its development, and in others supervened during the period of drug intoxication and without any direct relation with it. Conditions of a diverse kind have been cured, or considerably ameliorated, by deprivation of the drug: intractable sciatica, crises of asthma, rheumatism, ill-defined vertebral pain, digestive disorders, pulmonary tuberculosis complicated with pneumothorax, and sequelæ of appendicitis such as abdominal fistula. To illustrate favourable reactions of this kind produced by demorphinization of drug addicts, the authors describe in detail cases suffering from vertebral osteitis with fistulization, herpetiform dermatitis, psoriasis, and chronic peritonitis diagnosed as abdominal tuberculosis, respectively. The results are striking, especially the last, in which a grave peritoneal-intestinal syndrome of unknown origin, and treated by the use of heroin to soothe the pain, was completely cured by the effect of lively organic reaction produced by the process of de-intoxication for the drug habit. It is maintained that these cases show that the method of rapid de-intoxication is the proceeding of choice in treatment of drug habits.

Experimental Researches on Drug Addiction.—The problem of drug addiction has been of sufficient gravity to attract the attention of a number of scientific investigators with a view to discovering the ultimate causes of the drug craving. In general this experimental work has been carried on with the lower animals as subjects. In many respects the parallelism between morphine poisoning in dogs, rabbits, or guinea-pigs is by no means complete; this is notably the case during the withdrawal period, which presents the most characteristic symptoms. L. C. Scott, F. A. Loria, and J. C. Tardo¹³ have been unable to observe by experimental researches with the electrocardiogram and the study of behaviour that a dog exhibits, during deprivation, any desire for the alkaloid comparable with that of a human being. In addition, the following conclusions were reached: (1) Immunity developed by increased dosage disappears very rapidly. This fact, which also holds good for the human being, argues against the presence of an antibody. (2) Whole blood does not measurably protect a normal animal, even though the blood has been given ample time to alter, combine with, or destroy the morphine. (3) Morphine, unlike quinine, is not abstracted from serum by red cells. These apparently play no part whatever in protecting the body from the poisonous action. It is not known whether the serum produces any alteration in the morphine molecule; that it is not destroyed was shown by its recovery from the serum. (4) Morphine injected

into a portal branch passes rapidly into the general circulation; it is probably altered, because the identification tests, while faint, show a greenish tinge. This is also the case with morphine which remains behind in the liver capillaries. (5) Liver tissue alters morphine very markedly, and whatever the substance may be, it is, at any rate, innocuous and produces no symptoms of morphine poisoning when injected into susceptible animals. (6) It is highly probable that the liver is at least one of the organs, if not the principal one, involved in the destruction of morphine.

REFERENCES.—¹*Practitioner*, 1924, Oct., 216; ²*Ibid.* 295; ³*Lancet*, 1924, ii, 491; ⁴*Ibid.* 140; ⁵*Zeits. f. d. g. Neurol. u. Psychiat.* 1925, May; ⁶*Münch. med. Woch.* 1924, Nov. 7; ⁷*Practitioner*, 1924, Oct., 236; ⁸*Ibid.* 244; ⁹*Wien. klin. Woch.* 1925, June 18, 108; ¹⁰*Zeits. f. d. g. Neurol. u. Psychiat.* 1925, March; ¹¹*Jour. Amer. Med. Assoc.* 1924, Aug. 2, 321; ¹²*Presse méd.* 1924, Nov. 29, 948; ¹³*Arch. of Internal Med.* 1925, April, 472.

ALOPECIA. (See also SCALP, DISEASES OF.)

E. Graham Little, M.P., M.D., F.R.C.P.

R. Sabouraud¹ draws attention to the types of baldness caused by eczema of the scalp, the most important of which is impetiginous eczema; and he gives the wise advice that these patients, in addition to local treatment, require good food, good ventilation, exercise in the open air, and especially sea air. Another variety of the same infection is marked by a flaky scaling of the scalp, imitating asbestos, and causing the loss of hair. This type is commonly taken for psoriasis or pityriasis, neither of which causes falling of hair. The treatment recommended is to wash the scalp frequently with **Alibour Water** and subsequently to apply 20 per cent **Tar Ointment**, of which **Oil of Cade** is the best form.

REFERENCE.—¹*Gen. Med. Press*, 1925, April, 273.

AMŒBIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PATHOLOGY.—A. M. Smith¹ recalls his war work showing the presence of from 1.5 to 5.6 per cent of *E. histolytica* cyst-carriers among the healthy population who had never been out of Great Britain, and 4.2 to 9.7 per cent in two asylum series, infection taking place from one human being to another, as no animal carriers are known. Practitioners should therefore be on the look-out for occasional indigenous cases of the disease. T. Potano² has studied 150 cases of intestinal amœbiasis in Italy, where acute cases are rare, but intermittent diarrhœa and constipation are the usual form. H. W. Acton and R. Knowles³ discuss *E. histolytica* carriers in Calcutta, especially from the point of view of microscopical diagnosis; such cases are rarely healthy, but suffer from irregularity of the bowels due to infection, so they object to the war term of 'cyst-carrier'; diarrhœa, abdominal pain, and slight fever indicate the nature of the cases, which should lead to their detection by repeated microscopical examination of the stools; illustrated directions regarding this examination are given for 'tyros', and the usual treatment is advised. H. C. Clark⁴ describes the distribution of amœbic lesions in 19 years' post-mortems in Panama, a very small proportion of which occurred after the introduction of emetine treatment, only 5 of 92 cases being recorded as having been treated with that drug. About 60 per cent showed general ulceration of the large bowel, and in about 40 per cent only the more dependent parts—cæcum, ascending colon, sigmoid, and rectum—were involved. Perforations occurred in 10.7 per cent; liver abscesses of varying degree in 51 per cent, being solitary in 42 per cent; rupture into the peritoneum occurred in 14.7 per cent, and through the diaphragm in 12.6 per cent.

CLINICAL.—A. N. Worsley and J. E. Bateman⁵ describe a case of urinary amœbiasis, with recurrent attacks of frequent micturition and pain, mistaken

for renal calculus until, during the third attack, amœbæ were found daily in the urine, and emetine treatment rapidly cured the patient. J. J. Vallarino⁶ reports on X-ray examinations in amœbic dysentery at Panama, and found examinations twenty-four hours after a barium meal better than after barium enemata. The distribution and extent of the bowel lesions were indicated by mottled areas in place of the normal contour of the bowel, the salt being deposited in the ulcers, which were found to be most frequent in the cæcum and ascending colon up to the hepatic flexure, and next most commonly in the sigmoid. L. F. Heimburger⁷ describes extensive amœbic ulceration of the skin in the right hypochondrium and lumbar regions following the bursting of a small unsuspected liver abscess, in which hypodermic injections of emetine had a marvellous effect. [Such cases were not rare in Calcutta after opening liver abscesses in pre-emetine days.—L. R.]

TREATMENT.—M. Petzetakis⁸ in Alexandria has found the systematic use of intravenous injections of Emetine to be much more curative than intramuscular ones in both acute and chronic cases of amœbic dysentery as seen in Egypt, the acute cases clearing up more rapidly, as advised by Rogers and others, and also in chronic ones to prevent the frequent relapses after other methods of using this drug. He has studied the action of the drug on the heart and circulation after intravenous use, and find that with doses over 0.04 grm. hypotension begins to be produced, which is less if the dose is diluted in 3 to 20 c.c. saline when over 0.06 grm. are given, which dose is indicated in treating severe dysentery cases, and he advises injecting feeble subjects with smaller doses. He has employed this mode of administration regularly for over a year without any accident, and advises in acute dysenteric attacks a total of 0.35 to 0.45 grm. in 12 days in doses of 0.03 to 0.06 grm., while in very severe cases he gives from 0.08 to 0.1 grm. doses daily, quantities of over 0.05 grm. being given in two doses, and in gangrenous cases he has gone up to 0.15 a day in three doses, cardiac tonics being administered. By these means he obtained more rapid improvement and disappearance of the amœbæ from the stools, and fewer relapses, pain quickly disappeared, and the stools fell from 30 or 40 to nil in forty-eight hours. To avoid relapses he advises a further series of injections 20 to 30 days later of five or six doses, totalling 0.5 grm., and if possible three more similar series during the following year. In the very difficult chronic relapsing cases with cysts in the stools, he has also found the intravenous method far more successful than any other plan in bringing about permanent cures after other methods had repeatedly failed, and similar good results have been obtained in cases of amœbic infection of the bronchi, urinary tract, liver, and appendix. He also discusses the toxicity of emetine, and finds it harmless in the quantities he uses ordinarily—namely, total amounts of 0.35 to 0.6 grm. in one month, while in young children the courses of injections total only from 0.05 at one year to 0.2 grm. at five to ten years. He has also added 0.5 to 1 c.c. of a 10 per cent solution of calcium chloride to the intravenous emetine in the same syringe as a cardiac tonic with advantage.

M. Petzetakis⁹ also reports favourably on the use of Stovarsal, first introduced for amœbic disease by E. Marchoux, although he does not agree that this drug always cures amœbiasis rapidly, and reports several cases of relapse two or more months after its use; but he regards its employment in the intervals between intravenous emetine treatment as of definite value. Dencoux¹⁰ also reports favourably on stovarsol in chronic amœbic dysentery in daily doses of 0.5 grm. orally for seven days, and half that dose for another week. Ch. Garin and Pierre Lepine¹¹ report on 208 cases of amœbic dysentery seen in the Lyons region of France, of which 40 were indigenous ones, with evidence of interhuman contamination in 72.5 per cent, and have employed

both stovarsal in 25-cgrm. doses orally in emetine-resistant cases twice daily during the first and third weeks, together with emetine in the second and third weeks; and stovarsol alone in doses of 75 cgrm. daily for one week during the first and third weeks, and 25 cgrm. every other day for a month or two; the *E. histolytica* cysts disappeared in four days as a rule. They also advise the use of Acetylarsan intramuscularly in 75-cgrm. doses in 8-c.c. ampoules once a week for four weeks in a case of amœbic hepatitis, and this drug has also been used once a week in addition to emetine on three days of the week. F. M. Johns and S. C. Jamison¹² also report favourably on stovarsol in amœbiasis, complete relief having been obtained in forty-six cases within three to six days with from 0.5 to 1 grm. orally daily, including both acute and chronic cases, while it was equally successful in amœbic hepatitis. Of 27 dysentery cases carefully studied, 21 have remained well for an average of 115 days, 5 relapsed within an average of 118 days, and one relapsed after eight courses of treatment; one or two courses of seven days are advised. They only twice saw mild arsenical rushes. Vialard and Darleguy¹³ report on the use of Treparsol (acid meta-amino-oxy-phenylarsenic) in chronic amœbic disease, in which it had a rapidly beneficial action on the symptoms and in causing the amœbe to disappear from the stool, while it is well tolerated for a few days, but the dosage used is not clearly stated.

W. M. James and W. E. Deeks¹⁴ discuss at length the symptomatology and treatment of dysentery at Panama, and advise the employment of emetine injections combined with their well-known treatment with 180-gr. doses of Bismuth Subnitrate in a tumbler of water every three hours night and day, and find that relapses are comparatively rare; they recommend the bismuth in smaller doses to be continued for at least six weeks after recovery in the milder cases, and in severe cases for two to four months. They think emetine should be avoided if surgical interference is called for.

AMOEIC LIVER ABSCESS.

P. A. Petridis¹⁵ advises the drastic operation for amœbic liver abscess of resecting three or four ribs, closing the pleural cavity by sutures, and incising the diaphragm sufficiently to admit of exploration of both surfaces of the liver by passing the hand through the extensive wound. He does not give the results or mortality of this formidable procedure, which he calls polypneuro-diaphragmotomy.

E. O. Thurston¹⁶ records a further series of 64 liver-abscess cases, in addition to the 100 of his former paper, which led him to the conclusion that "the open operation is to all intents and purposes obsolete except under unusual conditions", and to advocate Rogers' method of aspiration combined with the administration of emetine; the present series confirms him in that opinion, this method having been the operation of choice in Bengal for at least ten years. Of the 64 cases, 49 were treated by aspiration alone, with only 9 deaths, all being complicated or moribund cases on admission; there were practically no deaths in uncomplicated ones, while the total mortality in the 64 cases was 14 per cent, against over 60 per cent by the old methods. The injection of 1 to 2 gr. of emetine is as important as the aspiration, and he still advises a full dose to be injected subcutaneously at the time of the operation so as to be carried through the wall of the abscess with the effusion of serum into it after being emptied. In epigastric abscesses in particular the site of puncture should be in the upper part, on account of the contraction of the liver after removal of the pus. Two cases were opened for surgical reasons, and nine more were incised, cleaned out with gauze, and closed by primary suture: a useful procedure in cases of doubt or in some epigastric abscesses where it may

be dangerous to aspirate, and one which he has used for over twelve years. After the aspiration or incision, a course of 5 to 10 gr. of emetine should be given, but large quantities are to be avoided. When an abscess has once formed, emetine will only limit its extension and quiet symptoms, but aspiration is advisable to cure it. Drainage is only required in the rare cases complicated by secondary septic infection.

R. W. Runyan and A. B. Herrick¹⁷ find liver abscess uncommon in Panama—21 cases in six years. In large chronic forms they are accustomed to incise and drain, and in acute cases to explore the abdominal cavity, as more than one abscess may be present, and in their few cases their results have been good, with a mortality of 5 per cent. R. S. Townsend,¹⁸ in a thesis on tropical liver abscess in India, shows that since the introduction of emetine the deaths in the British Army in India has been reduced to only 25 per cent of its former figure. Contrary to modern opinion, he thinks aspiration should be confined to small abscesses, as he believes that large abscesses cannot be completely drained by aspiration, although papers referred to below show that no drainage is absolutely necessary if emetine is used; at the end of his paper, however, he mentions that it was written before he had read Rogers' Lettsomian lectures of 1922.

A. S. Fry¹⁹ reports the spontaneous absorption of two large amœbic liver abscesses, confirmed by X-ray examinations, absorption taking place under emetine injections within about one month, while at the same time the general condition of the patients greatly improved, showing that no harm resulted from the absorption of the sterile fluid in such abscesses; he urges that even aspiration could be dispensed with in many cases. V. S. Hodson²⁰ adds two more to the three similar cases cured by emetine alone he had previously recorded, and points out that gummata and tuberculous abscesses may similarly be absorbed under appropriate treatment without harm; he refers to a number of other recorded cases of liver abscesses absorbed under emetine, and concludes that operations should not be undertaken in amœbic liver abscess until emetine has been given a full trial. These, and many other similar cases, should give surgeons furiously to think before they submit their patients to drastic surgical procedures such as that described by Petridis, referred to above.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 897; ²*Policlínico*, 1924, Aug. 1, 417; ³*Ind. Med. Gaz.* 1924, Sept., 440; ⁴*Amer. Jour. Trop. Med.* 1925, March, 157; ⁵*Jour. Trop. Med. and Hyg.* 1924, Oct. 15, 278; ⁶*Amer. Jour. Trop. Med.* 1925, March, 149; ⁷*Arch. Derm. and Syph.* 1925, Jan., 49; ⁸*Presse méd.* 1924, Aug. 27, 705; ⁹*Ibid.* 1925, March 7, 299; ¹⁰*Marseille-méd.* 1925, April 25, 673; ¹¹*Presse méd.* 1924, Nov. 22, 927; ¹²*Jour. Amer. Med. Assoc.* 1925, June 20, 1913; ¹³*Presse méd.* 1925, June 6, 748; ¹⁴*Amer. Jour. Trop. Med.* 1925, March, 97; ¹⁵*Presse méd.* 1924, Nov. 12, 895; ¹⁶*Lancet*, 1924, ii, 1008; ¹⁷*Amer. Jour. Trop. Med.* 1925, March, 137; ¹⁸*Jour. R.A.M.C.* 1924, Dec., 401; ¹⁹*Ind. Med. Gaz.* 1924, Oct., 488; ²⁰*Lancet*, 1924, ii, 1275.

ANÆMIA, PERNICIOUS. (See also BLOOD TRANSFUSION.)

Ivor J. Davies, M.D.

Infection of the Gall-bladder in relation to Pernicious Anæmia.—Noble W. Jones and Thomas M. Joyce,¹ of Portland, Oregon, in an account of 13 cases, present some evidence that pernicious anæmia is related to and possibly caused by the action of hæmolytic and other micro-organisms, the gall-bladder being the focal source of sepsis. Their conclusions are stated thus: (1) Evidence is brought forth pointing to the presence of hæmolyzing and other micro-organisms in the wall of the gall-bladder as being the possible cause of idiopathic progressive pernicious anæmia; (2) In a series of 13 cases the presence of chronic gall-bladder disease was found by special study in each case; (3) Cholecystectomy on five patients of this series seemingly has removed some or all of the symptoms of

the disease. X-ray evidence of cholecystitis ('gall-bladder shadows') was considered to be more important than the macroscopical appearance of the gall-bladder at operation.

Relations between Gastric Achylia and Simple and Pernicious Anæmia.—Knud Faber and H. C. Gram,² of Copenhagen, discuss this question, and conclude as follows: (1) Gastric achylia is usually found in pernicious anæmia. (2) In 4 cases, the histories and examination of which are given, gastric achylia and normal hæmoglobin were demonstrated as long as twelve years before the onset of pernicious anæmia. (3) The results of hæmatological examination in 90 cases of gastric achylia are described; it is shown that hæmoglobin below normal is present in 41 per cent of these cases, or in 36.5 per cent of the 63 uncomplicated achylia cases. It differs from chlorosis by its presence in both sexes and by its tendency to recur.

The same authors³ describe the association of achylia and anæmia of different types in three members of the same family, and the behaviour of the colour index in pernicious anæmia. All showed gastric achylia, two suffered from pernicious anæmia, and one from a pronounced microcytic anæmia.

The Blood.—A. Piney,⁴ dealing with the *nucleated red cell in pernicious anæmia*, in an investigation of 34 cases of this disease, all of which showed achlorhydria and glossitis, differentiates three types of nucleated red cells. The cells with reticular nucleus were found in all the cases, both during remissions and relapses, and would thus appear to be specific in character, and to them the term megaloblast should be applied. The cells with 'cart-wheel' nuclei were found only in stages of the disease when marked anæmia was present, and the large 'cart-wheel' forms were only present in cases in which the red corpuscle count was less than 1.5 millions, and even in these were unusual. The only other condition in which Piney has seen megaloblasts in the sense of his paper was one of reputed *bothriocephalus* anæmia.

Adrianus Pijper,⁵ of Pretoria, has devised an *optical method for the diagnosis of Addison's anæmia*. The size of the red blood-cells is determined, and Pijper claims that his method, although not as precise as that of the graphic method of Price-Jones, is much simpler, and that with it a diagnosis of Addison's anæmia can be made from an unstained blood-film in a few seconds.

Russell L. Haden,⁶ of Kansas City, describes a *method for the determination of the volume index in the diagnosis of pernicious anæmia*. Haden remarks that the great variation in hæmoglobin readings in different laboratories makes the colour index a very uncertain diagnostic measure. The term volume index was introduced by Capps,⁷ in 1904, to denote the volume of the red cell relative to normal. Haden suggests a third index, which he calls the 'saturation index', which indicates directly the hæmoglobin content per unit volume compared with normal. In normal adults, the indexes are always 1.00, within the limits of technical error. In secondary anæmia, the indexes are usually less than 1.00, and seldom greater than 1.00. A plus volume index is a constant finding in pernicious anæmia. It is present even in early cases, in which other qualitative changes are not apparent. The colour index is never greater, and usually less, than the volume index. The saturation index is never greater than 1.

The Neurological Features of Addison's Anæmia.—W. Cole,⁸ in an analysis of 21 cases of Addison's anæmia, found lesions in the nervous system in 87 per cent, and, in a review of the literature, states that the frequency of such lesions varied from about 3 per cent in Bramwell's series to 80 per cent in cases collected from other sources.

C. E. Riggs⁹ also asserts that the nervous disturbances in pernicious anæmia are characteristic and distinctive, and are observed in over 80 per cent of the

cases. He adds that the greenish-yellow colour of the blood serum in pernicious anæmia is easily recognized by the naked eye, and is a positive—almost a pathognomonic—symptom of this disease.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1924, Oct., 469; ²*Arch. of Internal Med.* 1924, Nov., 658; ³*Ibid.* Dec., 827; ⁴*Jour. Pathol. and Bacteriol.* 1924, July, 217 (abstr. in *Jour. Amer. Med. Assoc.* 1924, Oct. 4, 1106); ⁵*Lancet*, 1924, ii, 367; ⁶*Jour. Amer. Med. Assoc.* 1924, Aug. 30, 671; ⁷*Jour. Med. Research*, 1903, v, 367; ⁸*California and Western Med.* 1924, Oct., 501; ⁹*Minnesota Med.* 1924, July, 465 (abstr. in *Jour. Amer. Med. Assoc.* 1924, Aug. 9, 472).

ANÆMIA, SICKLE-CELL.

Ivor J. Davies, M.D.

V. P. Sydenstricker¹ records further observations on this peculiar disease, which was first described by J. B. Herrick² in 1910. In all there are only nine contributions to the literature. It is probably confined to the negro race, and is familial, hereditary, and present from birth. The disease resembles familial hæmolytic icterus, for jaundice, anæmia, and evidences of erythropoietic activity are much alike in both, but it is distinguished by a remarkable type of poikilocytosis which is specific, and from which the disease derived the name originally suggested by Herrick. Another interesting feature is the occurrence of leg ulcer.

The disease presents two phases: the latent, when it can only be recognized by special methods of blood examination; the active, with distinctive symptoms and physical signs and an obvious blood picture. There is a marked disturbance of development and of nutrition. The distinctive and remarkable feature of the disease is seen in the changes produced in the red cells in a fresh sealed preparation of blood. In from 18 to 24 hours there is an extraordinary development of crescentic and stellate forms, with their active phagocytosis by the endothelial mononuclears, and at times by the polymorphonuclears. The red cells are reduced to about 2 millions, and the hæmoglobin proportionately. There is an average leucocytosis of 20,000. Many sickle cells are present, and poikilocytosis is otherwise marked. Normoblasts are numerous, whilst megaloblasts are rare, and nucleated sickle cells have been observed in three cases. The disease is dangerous in children, but relatively innocuous in adults and in the latent stage.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, July 5, 12; ²*Arch. of Internal Med.* 1910, Nov., 517.

ANÆMIA, SIMPLE.

Ivor J. Davies, M.D.

TREATMENT.—H. B. Porteous,¹ of Edinburgh, reports on the treatment of anæmia by administration of Spleen and Red Bone-marrow Extract, and refers to the results of other observers, including C. D. Leake and his co-workers.^{2,3,4} A similar extract was prepared from spleen, as Danilewsky and Selensky⁵ had shown that extracts of this organ have some hæmopoietic action when injected intraperitoneally. Porteous's contribution is a report of the treatment of four cases, and the results were also shown graphically. In addition to the cell-counts and hæmoglobin estimations, the fragility of the patient's corpuscles to hypotonic salt solution was estimated throughout the course of treatment, to discover whether there was any alteration in the resistance of these cells consequent on treatment. He concluded as follows: (1) The first two cases seem to confirm the findings of Leake, whilst in the last two uncertain or negative results were obtained. (2) The extract appeared to have no effect on the resistance of the cells to hæmolysis within the limits taken, all the cases showing a definitely increased resistance to hæmolysis from the start of the observations. (3) Probably a freshly-prepared extract would have a greater hæmopoietic effect than one that has been kept for two

or three months, as the first two cases showed better results—the extract then being fresher—and also the original worker utilized extracts which were comparatively freshly prepared.

C. D. Leake and J. S. Evans,⁶ of the University of Wisconsin, have recorded similar observations. They refer to the work of Whipple⁷ and of Musser⁸, and conclude as follows: "A review of the partially successful empirical use of marrow and spleen as hæmatopoietic agents justified an experimental investigation of these materials, in which it was demonstrated in normal animals and humans that they were more efficient in promoting hæmatopoiesis in combination than separately. Desiccated spleen and red bone-marrow combined in equal proportions by weight and administered in 0.3-grm. (5-gr.) capsules, has been found beneficial in the symptomatic treatment of secondary anæmia, and presents many advantages over iron and arsenic. In this report, 65 cases of various types of anæmia are presented, in which the action of desiccated spleen and marrow has been carefully followed. Of these 65 cases, 47 were moderately to markedly improved with respect to the blood picture and other objective criteria, while 18 showed slight or no improvement. Among these latter are 2 cases of progressive pernicious anæmia, the only cases of this class studied by us".

REFERENCES.—¹*Edin. Med. Jour.* 1924, Nov., 605; ²*Jour. Pharmacol. and Exper. Therap.* 1923, Sept., xxii, No. 2; ³*Ibid.* Dec., No. 5; ⁴*Wisconsin Med. Jour.* 1923, Dec., xxii, No. 7; ⁵*Arch. f. d. g. Physiol.* 1895, lxi, 264; ⁶*Amer. Jour. Med. Sci.* 1924, Dec., 815; ⁷*Amer. Jour. Physiol.* 1920, 53, 151, 167, 206, 236, 263, and *Arch. of Internal Med.* 1921, xxvii, 591; ⁸*Arch. of Internal Med.* 1921, xxvii, 638.

ANÆSTHESIA. (See also NOSE, DISEASES OF.) J. Blomfield, O.B.E., M.D.

Ethylene.—A large proportion of the writing on anæsthetics during the past twelve months relates to ethylene. Having been in use now for over two years, and a large number of cases being on record, this anæsthetic should have a fairly definite value assignable to it. Dr. Isabella Herb,¹ of Chicago, alone reports on more than 4000 cases, and other large series² have been forthcoming from various anæsthetists in America. In this country the experience has not been so wide, and there is still difficulty in getting the gas from manufacturers except in small quantity, while import is also met with almost insuperable obstacles. Nevertheless, careful observations have been made here, both in the laboratory and in the operating theatre, notably by Shipway and Pembrey,³ and we may speak with confidence of the practical value of ethylene. This anæsthetic is commonly and not unfairly regarded as occupying a place between ether and nitrous oxide in clinical value. As one observer states, however, it must be put considerably nearer to nitrous oxide than to ether. Its power to relax is greatly inferior to that of ether, although superior to that of 'gas', unless this is used by the method known as 'secondary saturation'. Ethylene can be used effectively with higher percentages of oxygen than will permit of anæsthesia with nitrous oxide, and this is, of course, in its favour. On the other hand, over-dosage is probably more dangerous than in the case of nitrous oxide, and several observers allude to the difficulty or impossibility of restoring respiration,⁴ even by insufflation of oxygen, if respiration has been brought to a standstill by over-dosage. It is essential therefore, in using ethylene, that efficient relaxation shall not be attempted by increasing the percentage of the gas at the expense of the associated oxygen. Addition of ether to the ethylene-oxygen mixture is the accepted method of reinforcing ethylene when its anæsthetic power is proving insufficient. According to Shipway, induction with 90 per cent ethylene is rapid, consciousness being lost in one minute or less. The percentage of oxygen is then gradually increased to 15 or 20; only exceptionally can 20 per cent be exceeded in adults.

These exceptions are usually persons gravely ill, and it is particularly for these people that ethylene is stated to have outstanding merits as an anæsthetic.

L. F. Sise,⁵ who has had a wide experience of ethylene, states that "it is pre-eminently the anæsthetic for the handicapped and bad-risk patients. It is undoubtedly the best general anæsthetic which we know to-day for such patients". This author believes that ethylene produces less effect on the body than any other known anæsthetic for a given depth of anæsthesia; but it is hard to reconcile this opinion with the generally accepted view as to nitrous oxide and oxygen in minor surgery. Moreover, there is apparently no doubt that ethylene is to some extent, though of course less than ether and chloroform, a lipid solvent, whereas nitrous oxide has no such effect. The early objections to ethylene, odour and inflammability, do not appear to be serious. The odour, if really pure gas is obtained, is slight. It varies greatly in different samples of the gas, depending apparently on the absence or otherwise of impurities. Inflammability is not markedly greater than that of mixtures of air and ether, and is easily avoided by proper precautions. Being an inflammable gas under pressure it is very sensitive to change of temperature. The cylinders in which it is compressed must not be stored near any source of artificial heat, nor must they be left in the sun. The mixtures of ethylene and oxygen commonly used in anæsthesia are inflammable, just as are those of ether and air, but are too poor in oxygen to explode. It requires a mixture of at least 40 per cent oxygen to 60 per cent ethylene to produce explosion. The ordinary mixtures may catch fire more easily than ether because they remain inflammable at a greater distance from the mask. Moreover, ether vapour, being about two and a half times heavier than air, tends to fall to the floor out of harm's way. The ethylene mixture drifts away, and, being diluted with air, becomes explosive at a distance where ether would be too weak to ignite. Ethylene has been ignited at distances of several feet from the patient. It follows that all possible sources of ignition must be kept out of the operating theatre during the use of ethylene, and it must not be employed in the presence of actual cautery or diathermy apparatus. The apparatus necessary for administration of ethylene is exactly similar to the 'sight-feed' nitrous oxide and oxygen machines. It is stated, however, that to avoid the danger of the static spark the rubber tubes from the machine should be replaced by metal; or at least a wire, preferably spiral, should be run down the inside of the tube. The static spark is the most elusive form of ignition, but several recorded instances of explosion prove that it is no imaginary danger.⁶ Easson Brown⁷ has made experimental investigations into the explosibility of ethylene mixtures. He found that it would take six hours' continuous anæsthesia to get the air of the room sufficiently charged with the minimum explosive strength (5 per cent) of ethylene for explosion to occur; and this presupposes all absence of ventilation.

When ethylene is given in too concentrated a strength, danger lies in its depressing effect on the respiration, and fatalities arise through respiratory arrest, the circulation apparently being only secondarily affected. The general tissues are unaffected by ethylene, according to most observers, and the clotting time of the blood is unaltered. Sweating and secretion of mucus are much less than with ether inhalation. Vomiting usually occurs during the return to consciousness, but does not as a rule recur. Of 68 patients, only 10 vomited more than once, and 2 of these severely.⁸ Generally patients recover rapidly and are ready to take food in a short time after operation. Nausea and the taste of the drug do not cling to them. If associated with anoxæmia, ethylene causes an uncompensated alkali deficit. The blood-sugar is increased to about the same extent as with nitrous oxide, and returns to normal within

twenty-four hours.⁹ The analgesic properties of ethylene are stated to be so superior to those of nitrous oxide, that a patient may be pink in colour and have an active lid reflex, and still make no movement at the beginning of operation. Shipway noted a roseolous rash, similar to that often seen in the early stages of ether inhalation, in several cases; in one patient it was vivid, and affected the entire body. Oozing from blood-vessels appears to be greater than with other anæsthetics, but blood-pressure and pulse-rate are but little affected. Ethylene has been used with success on an infant of two months and on a patient aged 77.¹⁰ The gas has been used extensively for midwifery in America. Heaney, of Chicago, writes enthusiastically of its benefits in normal and operative labour.¹¹ Langton Hewer,¹² after an experience of over a hundred cases, remarks on the lack of after-effects as the chief advantage of ethylene. He found that the 'single-dose' method gave about one and a quarter minutes' anæsthesia, more than that of 'gas' and less than that of ethyl chloride. He had used ethylene and oxygen intratracheally with good results. Most of those who have used ethylene have not preceded it by hypodermic injection of morphia or similar drugs, and there is not the same necessity for this that there is with nitrous oxide in major surgery.

Acetylene, which came into use about the same time as ethylene, has rapidly fallen behind in the race for popularity. Except in Germany,¹³ where under the name of *Nareylen* it is still being widely used,¹⁴ acetylene has been given up by most of those who have tried it. There is, indeed, no one quality which recommends it in the place of other anæsthetics, and in addition there is its unpleasant odour and its extreme inflammability. Moreover, to obtain it pure involves, as Shipway points out, highly inconvenient apparatus,¹⁵ mainly for the removal of acetone. Induction with a 75 per cent mixture of acetylene and oxygen takes place in about one minute; for maintenance the percentage of acetylene is gradually reduced and may be as low as 50 or 40 per cent. There is much salivation during acetylene anæsthesia, and the smell of the drug is present in the breath for some hours after inhalation.

Propylene¹⁶ holds out good hopes of being a useful anæsthetic, but at present experience with it is too slight to permit judgement to be made. It produced unconsciousness quickly and afforded good relaxation, but salivation and lachrymation were profuse, and these symptoms were possibly due to impurities. Propylene (C_3H_6) has an odour not unlike that of ethylene (C_2H_4).

McKesson recommends Gas and Oxygen anæsthesia for *nose and throat surgery*.¹⁷ The sitting position is desirable, and it must be possible to give the gases under considerable pressure. He relates a case in which a mass of adenoid having been inhaled into the trachea, life was saved by forcible insufflation of oxygen into the lungs. An obvious criticism is that by proper posture the inhalation of such a body should be impossible, and that forcible entry of gas would be likely to send it farther on. For obstructive conditions, such as brawny induration of the neck, the author believes that the facility for administering oxygen under pressure often saves life. It is probable, however, that in these cases life is not put into jeopardy if a side position and an open mask are used—the mouth being well opened by a gag before the administration is begun. The account of McKesson's case leaves the reader under the impression that the operator was handicapped to an extent which does not hold good when other anæsthetics than gas and oxygen are properly given for these cases.

The particular indications for *colonic oil-ether anæsthesia*¹⁸ are given by Meyer and Robbins as: great obesity with short neck in any type of operation; neurotics and the insane; goitre and hyperthyroidism; all operations on head, neck, chest, and upper respiratory passages; certain cases of bronchoscopy or œsophagoscopy. The mixture used consists of Ether, Formaldehyde,

and Olive Oil. The ether may be from 4 to 6 oz., the formaldehyde is always 2 drachms, and the olive oil is 2 to 3 oz. in proportion with the ether. Surgical anæsthesia "*may be expected after from forty to forty-five minutes*". The list of cases includes two deaths, "the result of unrecognized mechanical obstruction and suffocation"—these enforce the lesson that care to preserve a free air-way is as essential with rectal as it is with oral anæsthesia.

Intravenous injection was extensively tried some years ago both with ether and with hedonal. The method never met with great success—partly because of the large amounts of fluid necessarily infused, and partly because of fatalities from respiratory obstruction during the recovery period. Now M. Fredet and Mlle. Perlis¹⁹ communicate what they describe as a "new method of general anæsthesia". The novelty is not in the method, which is merely intravenous injection after an ordinary hypodermic, but in the drug injected. This is a body called *Somnifène*, and is a mixture of barbiturates of diethylamine. In *obstetrics* *sonnifène* has given great satisfaction to Perlis. One intravenous injection of 6 to 9 c.c., made when the first stage has really set in, enables a normal labour to be painlessly accomplished, and leaves the mother drowsy and semi-conscious for from twelve to twenty-four hours. No evil effects have been noted in the child, and there is no deleterious effect on uterine contraction, lactation, etc. The mother suffers sometimes from a transient diplopia. *Somnifène* by itself abolishes consciousness but does not produce relaxation or abolition of reflexes. For surgery it has to be supplemental, and by a preceding injection of morphia and scopolamine the authors claim to produce an anæsthesia allowing the performance of any operation. They qualify this, however, by stating that whiffs of inhalation anæsthetic may be needed for the skin incision and for closing the peritoneum. The intravenous injection is made from a quarter to half an hour after the hypodermic. Anæsthesia is said to last as long as three hours.

De-etherization by carbon-dioxide inhalation,²⁰ following the work of Yandell Henderson, has been tried in fifty cases at St. Luke's Hospital, San Francisco. The apparatus used comprised simply a carbon-dioxide tank, on portable stand, connected with a wash-bottle. The flow of gas is controlled by a gauge, and, after traversing the wash-bottle, reaches the patient through an ordinary gas tube and mask. The results do not appear striking; 23 of the 50 patients suffered no after-effects, but lack of detail as to length of operation, nature of patient, etc., makes this statement of little value. The inhalation of CO₂ drives up the respiratory rate and increases the pulmonary ventilation. Thus ether is eliminated with unusual rapidity, and herein lies the hoped-for diminution of all after-effects. The respiratory rate during inhalation of carbon dioxide varied from 20 to 40 per minute. Pulse-rate never increased more than 12 beats a minute. Colour was normal except in two cases. It is stated that the average time before the patient woke sufficiently to open his eyes when spoken to was one hour and fifteen minutes ordinarily, and after carbon dioxide inhalation it was within thirty minutes. The pulmonary ventilation of the average individual is said to be doubled when the carbon dioxide of the inspired air reaches 5 per cent.

The use of *Insulin* to prevent or counteract toxic conditions following ether anæsthesia is recommended by H. J. Minnitt.²¹ The author shows by means of graphs how rise in blood-sugar and appearance of toxic symptoms are associated in ether anæsthesia. His conclusions are so important that it is hoped they will be corroborated by a larger number of observations.

In an article on *post-anæsthetic vomiting*,^{21a} J. D. Mortimer gives interesting instances in which the vomiting was shown to be directly due to other causes than the anæsthetic: for example, to a plug of iodoform gauze in a jaw cavity,

to menstruation, and to obstruction after an abdominal operation. Three cases of *revival of the heart-beat*—one permanent and the others temporary—are related by T. Asteriades.²² Intracardiac injection of adrenalin was performed. The reader is referred for full information on this subject to the MEDICAL ANNUAL, 1922. Other recent cases are reported by Schapiro²³ and Masotti.²⁴

Hypnosis, not as the sole anæsthetic but as an adjuvant both before and after operation, is strongly advised by A. Haas,²⁵ who gives a good historical account of the practice of hypnotism. The author claims that the period of narcosis and amount of anæsthetic inhaled can be very materially lessened by preliminary use of hypnosis, and that much delay in recovery is caused by mental causes which can be removed by the application of hypnosis after operation.

Investigations made on the *blood of patients after anæsthesia*²⁶ have confirmed the experimental conclusion that the larger part of the fall in alkaline reserve occurs during the first few minutes. Marked changes in other constituents of the blood have occurred in patients who have only been under the anæsthetic a few minutes, and this is interesting in view of those mysterious cases of 'post-anæsthetic toxæmia' which have occurred after slight out-patient operations in children. These researches lead to the suggestion that there is a relationship between the sugar and the phosphate of the blood, for the blood content of both rises in anæsthesia, as it does in asphyxia or anoxæmia. Phosphoric acid apparently leaves the muscles in anæsthesia, and has a small share in lowering the alkaline reserve. Possibly it passes from the muscles to the blood as a hexose phosphoric acid compound. Duration of anæsthesia has apparently no relation to the change in the blood phosphates, nor to the fall in alkaline reserve.

Some experiments designed to show the effect of anæsthetics on the organism as a whole²⁷ led to results which are curiously at variance with clinical experience. In these experiments young and old dogs were subjected to long ether anæsthesia, and the urine and acid-base balance of the blood carefully examined. After one hour's anæsthesia the reserve alkali of the blood in the young animals remained normal and unchanged. In the older dogs there occurred not only a marked reduction of urine with appearance of albumin and casts, but also a sharp reduction in the diminution of the test dye. Moreover, these animals all showed a decrease in the reserve alkali of the blood. Now in human beings, generally speaking, we find an opposite state of affairs. Except for the respiratory system, older people suffer far less from after-effects than the young. It is rare, for example, to find an old person seriously affected by vomiting after anæsthesia, but this symptom is not unusual in the ordinary healthy young or middle-aged adult.

A *stimulant of the respiratory centre* which should be valuable to anæsthetists is described by Reichle²⁸ in *Alpha-lobelin*. This is the essential alkaloid of the herb *Lobelia inflata*, first isolated by Heinrich Wieland. It has been used subcutaneously as well as intramuscularly and intravenously, the dose being $\frac{1}{2}$ gr. subcutaneously for an adult. The action of the drug sets in within two or three minutes and lasts about three-quarters of an hour. This action is specific for the respiratory centre, and respiration has been restored when it had ceased and when artificial respiration had been of no avail. Several cases are quoted in which the injection of lobelin apparently saved life during narcotic respiratory arrest.

An investigation into the value of *pre-operative narcotics* leads Harmon²⁹ to the conclusion that these drugs should be given not less than forty-five minutes before the administration, that they shorten the time of induction, and lessen the amount of anæsthetic needed. He states that when the pre-operative

narcotic is given in magnesium sulphate solution there is less nausea and vomiting, and greater comfort afterwards.

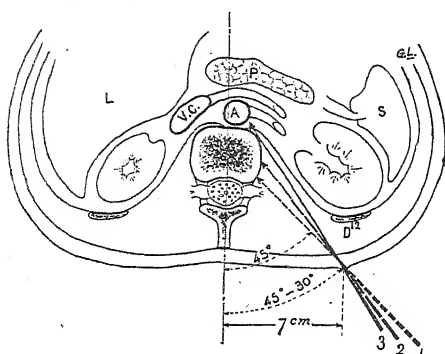


Fig. 1.—Splanchnic anæsthesia. Diagrammatic illustration of a cross-section of the body passing through the first lumbar vertebra at the level of puncture and injection. Arrows 1, 2, and 3 give in succession the manner of reaching the solar plexus with safety. (Figs. 1 and 2 reduced from the "Annals of Surgery".)

in certain cases of retroperitoneal growth making the vena cava inseparable from the aorta. Finsterer regards the possibility of injecting into the vena cava as the greatest danger of the splanchnic method. The precaution of sucking into the syringe before making the injection must always be practised, and will effectively guard against injecting into a vein. In 10 per cent of his cases he has had to use supplementary ether, generally because the local effect did not last long enough. An excellent brief summary of the history and literature of splanchnic anæsthesia is to be found in the *Annals of Surgery*,³¹ and the article by Labat contains also a good description of the technique of induction, with illustrations (Figs. 1, 2, and Plate II). In accounting for the occasional failures which confront even those experienced in the technique of splanchnic anæsthesia, Labat states that variations in the anatomy of each individual were chiefly to be blamed. The case with which the twelfth rib (under the lower border of which the needle is entered) can be defined varies with the weight of the patient, the degree of muscular relaxation, and the distortion of the spine due to position. For the reader interested in local anæsthesia for abdominal operations there is also an instructive article on local anæsthesia of the abdominal sympathetic system by R. E. Farr,³² who has for long been an enthusiast in this work. This writer believes in the introduction of local anæsthetics "intraperitoneally directly under the eye". For further reliable information

The hypodermic that Harnon recommends is *Morphia* and *Atropine* in 4 c.c. of pure sterile 25 per cent solution of *Magnesium Sulphate*, and he prefers to give the dose divided.

Regional Anæsthesia.—Finsterer, of Vienna,³⁰ is an ardent advocate of regional methods for operations on the upper abdomen. He has found paravertebral injections unsatisfactory, but has had good results from splanchnic anæsthesia by the Kappis method. He alludes to the danger of introducing the needle into the cerebrospinal canal, for the doses injected in the splanchnic method are, of course, dangerously large if put into the cerebrospinal fluid. The method also must be avoided

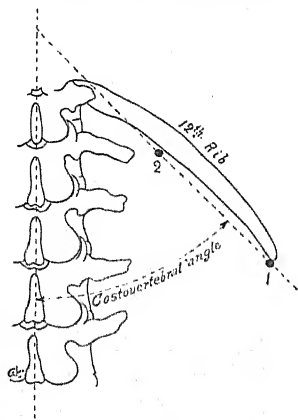


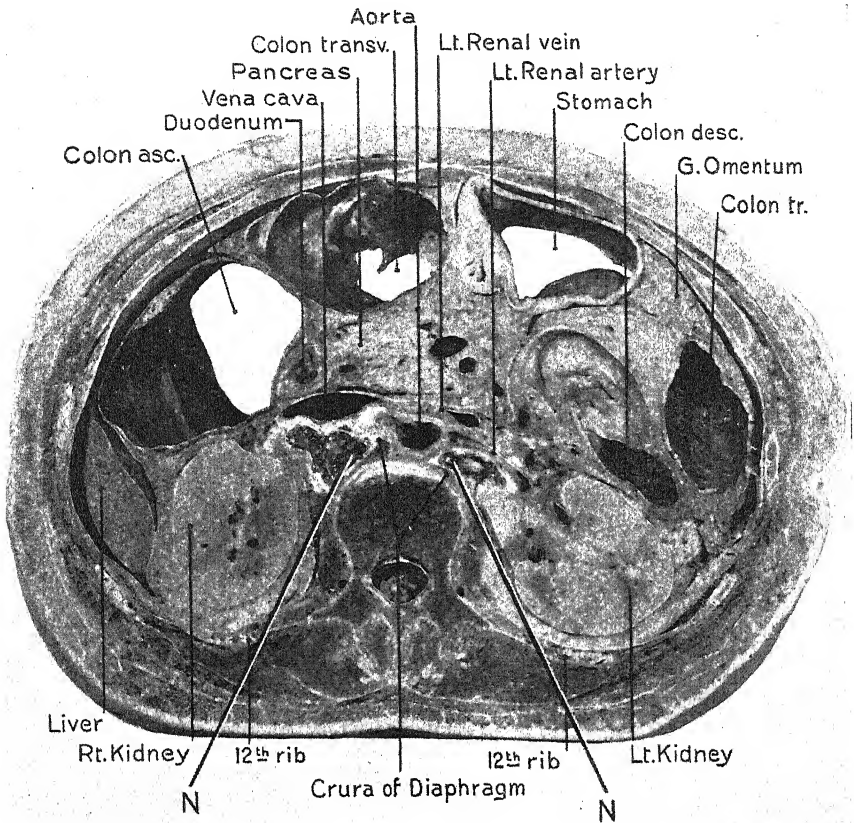
Fig. 2.—Splanchnic anæsthesia. Wheels 1 and 2 are raised at the extreme palpable points of the lower border of the 12th rib, which is defined by palpation from below upward and inward. The straight line passing through these two wheels marks with sufficient accuracy the direction of the 12th rib. The angle contained between this line and the middle line of the back is the costovertebral angle.

For further reliable information

PLATE II.

SPLANCHNIC ANÆSTHESIA

(GASTON LABAT)



Cross-section of female body (upper segment) through the usual sites of puncture on the lower border of the 12th rib, 7 cm. distant from the middle line of the back. N, Direction of needle.

Kindly lent by 'Annals of Surgery'

on splanchnic analgesia the reader is referred to the article of Hillman and Apperley in the *Lancet* of April 25, 1925. The same issue contains a comprehensive illustrated account of regional anæsthesia by Cade.

Sacral Anæsthesia.—The large proportion of failures which have attended epidural anæsthetic injections in many hands, and which have tended to lower the value placed upon the method, are well explained in an exhaustive contribution by Meeker and Scholl.³³ The authors describe and illustrate the many variations in the anatomy of the sacrum. These cause variations in the position of both the sacral hiatus and the lateral sacral foramina. Inability to perceive or correctly estimate these variations leads to the injections being made not in proximity to the sacral nerves, with consequent failure to produce analgesia. Properly performed, the combination of epidural anæsthesia, by caudal and perisacral injection, with abdominal field-block, gives perfect analgesia and relaxation for all pelvic operations, including especially prostatectomy. To ensure this success, however, an absolute familiarity with the anatomy of the part must be obtained by cadaveric as well as clinical injection and observation. Hope Carlton,³⁴ discussing the combined method just referred to, as used in the Mayo Clinic, records 134 cases in which 118 presented a good result.

Spinal Anæsthesia.—A solution composed of Stovaine gr. 0.75, Alypin gr. 0.15, Strych. Sulph. gr. 0.001, aq. dest. 10 c.c., for ten ampoules, is recommended by Vaquié,³⁵ who writes after an experience of over two thousand spinal injections. Hitherto he has confined his operations to those below the nipple line, but hopes to extend them upwards. Matons relies on a solution of Novocain and Caffeine.³⁶ The maintenance of proper blood-pressure during spinal anæsthesia has always been one of the difficulties of the method. W Steel³⁷ maintains that the best possible preventive of a dangerous fall of blood-pressure, which is not unusual during the first quarter of an hour after spinal injection, is the inhalation of Ether. He has compared the effects of this inhalation with those of hypodermic injection of caffeine, pituitary, strychnine, etc., greatly to the advantage of the ether. Leriche³⁸ arrives at the following conclusions with regard to spinal injection: (1) The diffusion is inversely proportional to the concentration of the solution injected. (2) It is also inversely proportional to the pressure of the cerebrospinal fluid. (3) The diffusion is directly proportional to the speed of the injection.

Local Anæsthetics.—The satisfactory results obtained with the borate of ethocaine, of which novocain is the hydrochloride, make it probable that this anæsthetic, 'Borocaine', will be of the utmost value as a substitute for cocaine. Borocaine has a more powerful surface action than cocaine in solutions of equivalent concentration. It is non-toxic and non-irritant, and there is no reason to believe that it could set up a drug habit. Solutions of borocaine keep well.³⁹ The common use of hypodermic injections of morphia before local anæsthetic injections is decried by Gordon Anderson.⁴⁰ He disbelieves in the supposed power of the hypodermic to lessen the sensibility of the patient to the pricks of the anæsthetic injection, or to mitigate any preliminary fear or emotion. The time for the morphia is, he maintains, after operation, not before it. In a preliminary report on cocaine, butyn, tutocain, and other local anæsthetics, Copeland⁴¹ arrives experimentally at the conclusion: (1) That the best of the local anæsthetics for the eye are Cocaine and Butyn. (2) For the nose, Cocaine and Tutocain are alone useful. (3) For subcutaneous injection, Novocain is much the best. (4) Besides cocaine, it is believed that the properties of butyn and tutocain may render them addiction drugs. Butyn causes marked swelling of the nasal mucous membrane, and being precipitated by sodium chloride its action is uncertain. It is twice as powerful as cocaine. It has a drying effect on the cornea. Cocaine he found

to be the only local anæsthetic to induce constriction of vessels by a peripheral action. It is noticeable that a good many fatalities have already been attributed to butyn.

A new local anæsthetic is **Psicaine**, an artificial cocaine. It is the acid tartrate of an artificial isomer of cocaine, soluble in water and not harmed by brief boiling. The experimental toxicity is three-quarters that of cocaine hydrochloride.⁴² Used in the nose a 7 per cent solution gives anæsthesia identical with that produced by 5 per cent cocaine hydrochloride solution, and the shrinkage caused is the same.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, Aug. 2, 350; ²*Boston Med. and Surg. Jour.* 1925, Feb. 12, 288 et seq.; ³*Lancet*, 1925, i, 1126 et seq.; ⁴*Brit. Jour. Anæsth.* 1924, Jan.; ⁵*See ref.²*; ⁶*Jour. Amer. Med. Assoc.* 1924, Dec. 27; ⁷*Ibid.* March 29, 1039; ⁸*See ref.³*; ⁹*Boston Med. and Surg. Jour.* 1925, Feb. 12; ¹⁰*Jour. Amer. Med. Assoc.* 1924, Sept. 13; ¹¹*Surg. Gynecol. and Obst.* 1924, May, 692; ¹²*Lancet*, 1924, i, 173; ¹³*Zentralb. f. Chir.* 1924, Dec. 13, 2752; ¹⁴*Münch. med. Woch.* 1925, May 22; ¹⁵*Lancet*, 1925, i, 1126; ¹⁶*See ref.¹³*; ¹⁷*Jour. Amer. Med. Assoc.* 1924, Nov. 8, 1502; ¹⁸*Ibid.* Nov. 15; ¹⁹*Bull. et Mém. de la Soc.* 1924, July 15, 739, and *Presse méd.* 1924, Aug. 13; ²⁰*California and Western Med.* 1924, Dec., 617; ²¹*Lancet*, 1925, i, 761; ^{21a}*Ibid.*, 329; ²²*Presse méd.* 1925, May 13; ²³*Zentralb. f. Chir.* 1925, April 11, 798; ²⁴*Políclinico*, 1925, Jan. 5, 9; ²⁵*Arch. f. klin. Chir.* 1925, April 2; ²⁶*Quart. Jour. Med.* 1925, April, 261; ²⁷*Surg. Gynecol. and Obst.* 1925, April, 493; ²⁸*Anæsthesia and Analgesia*, 1925, Aug., 218; ²⁹*Ibid.* Feb., 15; ³⁰*Arch. f. klin. Chir.* 1924, Sept 23, 1; ³¹*Ann. of Surg.* 1924, Aug., 161; ³²*Surg. Gynecol. and Obst.* 1924, Sept., 335; ³³*Ann. of Surg.* 1924, Nov., 739; ³⁴*Brit. Med. Jour.* 1925, i, 648; ³⁵*Presse méd.* 1925, March 28, 405; ³⁶*Ibid.* 1924, Dec. 13, 991; ³⁷*Jour. Amer. Med. Assoc.* 1925, Jan. 10, 70; ³⁸*Ann. of Surg.* 1925, Jan., 38; ³⁹*Lancet*, 1925, ii, 196; ⁴⁰*Ann. of Surg.* May, 994; ⁴¹*Brit. Med. Jour.* 1924, ii, 41; ⁴²*Ibid.* 1925, i, 11.

ANEURYSM. (See also SYPHILIS, CARDIOVASCULAR; VASCULAR SURGERY.)

J. E. MacIhwaine, M.D.

S. B. Boyd Campbell, M.D.

Aneurysm of the Heart.—W. Rindfleisch¹ shows the difficulty of diagnosing aneurysm of the heart. The usual site being the apex, it is difficult to differentiate abnormal pulsation in this area, and percussion and auscultation likewise are of little assistance. Röntgen rays help to a certain extent; but owing to the apex aneurysm burying itself in the often considerably enlarged liver, radiological proof is not definite. The conditions are more favourable when the swelling is higher up, as in his first case, in which a slight protuberance was to be seen on the ventricle bend. He quotes another case where the X-ray plate of a twelve-year-old boy who had severe endomyocarditis showed on the greatly rounded rim of a much enlarged left ventricle a very clear extra protuberance in the upper section. He considers this a rare case of aneurysm arising from mural endocarditis. X-ray examination in the various axes will be of use in fixing the exact meaning of such abnormal protuberances projecting from the silhouette of the heart.

REFERENCE.—¹*Münch. med. Woch.* 1924, Dec. 5, 1719.

ANGINA PECTORIS. (See also CORONARY ARTERY DISEASE.)

J. E. MacIhwaine, M.D.

S. B. Boyd Campbell, M.D.

The relationship of tobacco to angina is discussed by L. Gallavardin,¹ who, in a series of 200 anginal male patients with a negative syphilitic history and no evidence of syphilitic stigma, found that 27 per cent had never smoked and 4 per cent had ceased to smoke several years before the onset of the first anginal attack, whilst 68 per cent were light, moderate, or heavy smokers. If the whole feminine group is added, i.e., 21 per cent of all cases, it is found that half of the non-syphilitic anginal patients had never smoked. He therefore considers that tobacco is not the cause, which is as yet completely unknown,

capable of developing the anginal attacks in non-syphilitic cases. Gallavardin² also, from 450 observations, discusses the relation between syphilis and effort angina, and believes that one is not justified in considering effort angina as a sign of syphilis any more than in imposing, without examination or discussion, a specific treatment on all anginal cases.

C. Lian, R. J. Weissenbach, and G. Parturier,³ in their communication on the *relation between angina pectoris and gall-bladder infection*, state that among the affections capable of causing a serious cardiac reaction, from mere palpitations and extrasystolic arrhythmia to angina pectoris and cardiac insufficiency, biliary lithiasis fills an important place, greater than that which has been generally accorded to it up to the present.

PROGNOSIS.—Luis Hamman⁴ says that angina pectoris may manifest itself by: (1) Sudden death in the first seizure; (2) Sudden death or death from myocardial insufficiency after months or years of attacks; (3) A period of attacks followed by a long or short period of remission, then a recurrence with perhaps sudden death; (4) A period of attacks with a long remission, and patients die from something else; (5) An unusually severe seizure followed by death, not sudden, but after hours or days of agony from a gradually failing heart; (6) An unusually severe but not fatal seizure, followed by a period of apparent recovery, and months or years later by sudden death from rupture of the heart, or gradual death due to myocardial insufficiency. Relatively small lesions may cause severe symptoms, and thus account for remissions and apparent cures. The severe type often shows no cardiac abnormality in clinical examination. Syphilitic aortitis in people under 45 and arteriosclerosis after 50 years are predisposing causes. Attacks following slight exertion are worse than those only coming on after severe exercise or heavy meals. If regulation of the patient's life or rest in bed is followed by improvement, the outlook is better. Months of careful observation regarding the response of the heart to rest, exercise, worry, care, injections, and the many other influences that may act upon it beneficially or harmfully, is important in prognosis. Electrocardiograms may show alteration in the QRS complex, and in the form and direction of the T wave. Inversion of the T wave is a grave sign.

SURGICAL TREATMENT.—Almost the last written words of Sir James Mackenzie⁵ were upon this complaint, from which he himself suffered. In his critique on the surgical treatment of the malady, he says: "All the surgeon could hope to do would be to cut the nerves that carry the impulses that give rise to pain from the damaged heart to the centre of consciousness. Is such a procedure wise, and is it for the best interest of the patient that he should be deprived of a signal that may be of great value? These hearts can only accomplish a small part of the work they should perform. A muscle like the heart can be forced to work till a stage is reached when they can do no more work. When this stage is reached, no blood can be thrown out, and the consequences of a failure of output are unconsciousness and death." The presence of pain makes the patient realize its significance. "Pain is not a dangerous symptom, but often a beneficent agent, as it directs attention to a morbid process, and helps in maintaining the efficiency of the heart. If the nerves are cut, this indication is removed." Studying the published records of operated cases, there is an absence of a division of anginal cases into *primary*, with varying degree of morbid change, and *secondary*, with no affection of the heart. Though pain may be relieved, the patient is not cured. Many patients have, without operation, remissions for months or years. He ends with a plea for the further investigation of the cardiac nerves.

D. Daniélopou⁶ believes that the starting-point of angina is the myocardium. He discusses two groups of reflexes; the depressor or parasympathetic group,

which slows the heart, diminishes the force of myocardial contraction, and lowers the arterial tension; and the pressor group, which is sympathetic, accelerates the heart, strengthens the contraction, and raises the arterial tension. The increase of arterial tension, the strengthened heart-beat, lead to the belief that during an anginal attack the pressor reflex is dominant. Daniélopou suggests section of the cervical sympathetic chain and the vertebral nerve above the inferior cervical ganglion, the nerve of Hofer, or any corresponding nerves present, together with the nerves which spring from the cervical sympathetic above the superior cervical ganglion and pass to the heart. Thus, while preserving the important centrifugal nerves, which are essential to the action of the heart, we are cutting the greater number of ascending sensory fibres, to which is assigned an important part in the launching of an anginal attack. As the left side of the heart is the principal site of an attack, the nerves on the left side should be severed first.

J. N. Langley⁷ points out that the operations described for the relief of pain in angina pectoris are all open to grave criticism from the point of view of physiological experiment. The theory is that a considerable number of sensory nerves of the heart pass to the central nervous system by way of the cervical sympathetic and the vertebral nerve. Langley thinks that the reflex resulting from stimulation of the cervical sympathetic is due to the vagal fibres it contains, and the reflexes from stimulation of the vertebral nerve occur because a spinal nerve is in close association. He details his experiments on cats which indicate that if, as Daniélopou suggests, the cervical sympathetic together with any branches it may give off in the neck, the vertebral nerve, and the depressor nerve were cut, no appreciable number of afferent sympathetic fibres to the spinal cord would be affected. This operation would interrupt most of the vagal afferent fibres from the aorta, but very few if any of the fibres from the heart. He concludes that from an operative point of view the simplest procedure is to cut the nerves passing medially from the ganglion stellatum, leaving intact the vertebral nerve and the other rami communicantes.

W. B. Coffey and P. K. Brown⁸ report on additional cases. Their first 4 patients were operated on by severing merely the main left sympathetic trunk below the superior ganglion, and the superior cardiac nerve. In the fifth patient the ganglion was removed. They now add 9 cases in which the operation consisted in removal of the superior ganglion. Two of these cases died, one unexpectedly shortly after operation, and the other death was not unexpected, as he was a chronic alcoholic and had a chronic pulmonary condition. The remaining cases proved a complete success as regards relief from anginal pain.

M. R. Reid and A. Friedlander⁹ report on 2 cases, one 48 years old, the other 54. They were operated on by Reid, Jonnesco's method being used. The left sympathetic chain, including the superior, middle, and inferior cervical ganglia, and the first thoracic ganglion, was incised. The first case had immediate relief from the sensation of pressure and tightness in the precordial region, and there was less discomfort in his left arm. No anginal attacks were recorded since operation, but he had ptosis of the eyelid, slight exophthalmos, and a contracted pupil. The blood-pressure in the right arm on the eighth day was 148-80, and in the left 136-78. There were marked sensory changes in the left side of the face, left arm, and left chest wall. Patient was alive about twelve months afterwards, with no attacks of angina since operation. The second case had marked relief from symptoms for fourteen days, when he suddenly died, but the death was a painless one.

J. Diez¹⁰ reports that he operated on 3 cases, and that not only the paroxysms of pain, but also the suffocative attacks and the erethism of the heart disappeared, and the function of the myocardium kept progressively improving.

A. Schittenhelm and M. Kappis¹¹ divide operations into three groups: (1) Removal of whole or greater part of the neck sympathetic with the upper chest ganglion, mostly done on left side; (2) Removal of the upper neck ganglion on one side, especially left; (3) Depressor operation. Forty-seven operations were done, with about equal successes and failures. They report 2 new cases. They question whether the section of the sympathetic did not bring on cardiac failure (they say the second operation may have done harm, the first did not). They criticize Daniélopou's statement that removal of the stellate ganglion has a mortality of 60 per cent. Kappis quotes 27 cases of total extirpation of the sympathetic, and shows that there is a 15 per cent death-rate. He mentions 23 cases of Coffey and Brown's operation (removal of the superior ganglion and cutting the sympathetic), 14 depressor nerve operations, as well as Jonnesco's 200 cases and Brünig's 20 of removal of the sympathetic in the neck, where after a long period no injury of the heart has taken place. He further states that Wenckebach says that the pain of angina pectoris is not protective, but terrible and unbearable, that it raises blood-pressure and increases pulse-rate, throwing heavier work on the heart. The attacks therefore bring about a direct injury to the heart. He notes the case of Brünig's was successful in vasomotor angina. He considers that the operation of Coffey and Brown has led to as good results as complete removal. Sauerbruch describes 3 anginal cases where operation relieved the pain.

F. Brünig¹² reports a case of angina pectoris with an angiospastic basis. The patient, a woman, had attacks of severe pain every other day, which were associated with an increase in blood-pressure from 150 to 240 mm. Hg. After the operation she was entirely free from these attacks, and the blood-pressure remained between 140 and 160 mm. Only the lower pole of the superior cervical ganglion was resected; in addition, the left sympathetic nerve, including the stellate ganglion, was removed. He thinks that this case confirms the view that the pain in the heart is due to angiospasm of the coronary arteries, as the rise in blood-pressure itself is not a cause of pain.

J. Smith and R. D. McClure¹³ report two cases. In one case marked priapism occurred in the interval between operation on the left side and the later operation on the right side. In both cases there was a great decrease in frequency of the seizures, and a marked reduction in their intensity, but in neither was there complete freedom from pain. In one case this may have been due to the first thoracic ganglion not having been removed. In the second case pain was chiefly on the right side, and as only a left sympathectomy was done, this may have accounted for the pain remaining.

C. G. and A. F. Jennings¹⁴ report on one case. At operation a nerve was found running along the anterior surface of the longus capitis muscle whose position accorded with that of the cervical sympathetic. Tracing it upwards and downwards for three inches no ganglion was found, but on pinching it with forceps the pulse-rate increased to 120 per minute. It was therefore decided that it was a sympathetic nerve without a ganglion on the depressor nerve after separation from the vagus. Three inches of the nerve were excised. Two months after the operation the patient had had no anginal pain, but upon three occasions during the first two weeks he complained of all the symptoms except the pain. They cite 21 cases of operations for angina pectoris, with 19 recoveries and 2 deaths. In 16 cases the operation performed was resection of the cervical sympathetic, in 5 cases resection of the depressor nerve. Relief of the anginal pain was more or less complete with both operations. There is no evidence to prove that it will in any way improve the pathological condition.

M. R. Reid and W. De W. Andrus¹⁵ give a summary of 64 cases operated

on for angina pectoris. In 50 cases the sympathetic nervous system was operated on, in 10 the depressor nerve of the parasympathetic system. In 2 cases both the depressor and sympathetic were removed. Thirteen of the patients were definitely relieved of pain, the best results being obtained by doing a cervico-thoracic sympathectomy.

Louis Ransohoff¹⁶ operated on 2 cases, doing a left cervico-sympathectomy, with relief of pain.

J. Arce¹⁷ reports 3 cases, the interval since operation being only four months at longest, but so far there has been relief of pain.

MEDICAL TREATMENT.—The treatment of angina pectoris from a medical point of view has been presented by John Hay,¹⁸ and may be briefly summarized as follows: The first essential is to explain to the patient the significance of the problem, and the importance of adjustment of mode of life. Any associated lesion such as hypertension requires treatment. Exercise is to be avoided after a meal. Early to bed advisable, and sheets should be warmed. If syphilis is suspected, treat accordingly. Diet small, fluid at meals limited, meat and starchy foods to be limited. Bowels to be kept regulated. Exercise to be limited, and patient's own sensations are a good guide to this. If mental worry is a cause, bromides may be required.

Medicinal treatment—Potassium Iodide, Arsenic, Bromides, Belladonna, Theobromine, 5 gr. four times a day, or Diuretin 10 gr. three to four times daily—appears to diminish liability to pain. Diathermy is on trial, but appears to diminish both the frequency and the severity of the attacks of anginal pain. On the first indication of substernal discomfort, a tablet of Trinitrin slowly chewed may avert it.

Treatment during an Attack.—Inhalation of Amyl Nitrite usually diminishes the pain and relieves distress. If not, give Morphine in a large dose combined with Atropine $\frac{3}{16}$ gr. Chloral 10 to 15 gr. may be given. If the attack is very bad and resistant to morphia, it may need Chloroform. A Carminative or Brandy or Whisky, by causing belching, often relieves.

L. F. Bishop¹⁹ strongly advocates the use of Castor Oil. He prescribes 1 oz. of castor oil, 2 gr. of menthol, and 10 min. of tincture of iodine, to be taken immediately and to be repeated on the third and fifth nights.

E. Wiechmann²⁰ has tried Theominal, a tablet containing 0.3 grm. theobromine and 0.03 grm. luminal. One tablet three times daily was used. In two cases they tried whether aortic pains, caused by sclerosis of the breast aorta, and having a certain similarity with the heart pains in angina pectoris, could be removed by an administration of one tablet of theominal three times a day for a considerable period. The result was negative. It was remarkable that in one of the cases the systolic blood-pressure sank under the theominal therapeutics from 230 mm. Hg to about 50 mm. Hg, and after its discontinuation immediately rose again.

REFERENCES.—¹*Presse méd.* 1924, July 23, 622; ²*Ibid.* July 16, 601; ³*Ibid.* Nov. 29, 945; ⁴*Amer. Jour. Med. Sci.* 1924, Dec., 786; ⁵*Lancet*, 1924, ii, 695; ⁶*Brit. Med. Jour.* 1924, ii, 553; ⁷*Lancet*, 1924, ii, 955; ⁸*Arch. of Internal Med.* 1924, Oct., 417; ⁹*Jour. Amer. Med. Assoc.* 1924, July 12, 113; ¹⁰*Rev. Assoc. méd. Arg.* 1924, June, 5; ¹¹*Munch. med. Woch.* 1925, May 8; ¹²*Klin. Woch.* 1923, ii, 777; ¹³*Surg. Gynecol. and Obst.* 1924, Aug., 210; ¹⁴*Med. Jour. and Record*, 1924, Oct. 1, 311; ¹⁵*Ann. of Surg.* 1925, March, 591; ¹⁶*Ibid.* 585; ¹⁷*Jour. Amer. Med. Assoc.* 1925, March 7, 787; ¹⁸*Lancet*, 1924, ii, 979; ¹⁹*Therap. Gazette*, 1925, May, 313; ²⁰*Munch. med. Woch.* 1925, April 17, 647.

ANKYLOSTOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—A. C. Chandler¹ has investigated the possibility of animals disseminating ankylostomes in India, where pigs, dogs, and, to a less extent, fowls commonly consume human faeces, and he has found that the ova of human ankylostomes readily pass through the intestinal canals of all these

animals, for at least seventy-two hours after being fed on ova-containing matter, who may thus disseminate the parasites considerably beyond the areas of contamination of the soil directly by human beings, while domestic animals may also spread the eggs and larvæ by carrying them on their feet and bodies. The same worker² has investigated the disputed question as to how far hookworm larvæ can migrate through soil, using for the purpose specially constructed vessels allowing of continued irrigation to keep the soil moist. He has confirmed the conclusions of Augustine, Cort, and Payne in Trinidad that the larvæ do not migrate laterally to any appreciable extent, but can be easily scattered by surface water, and have a tendency to migrate upwards through coarse soil, although only to a very restricted extent up the sides of a soil wall, but he does not think the upward migration is due to an upward flow of surface water as Payne suggested. A. Felix³ describes a new hookworm focus in a Jewish colony in Palestine.

TREATMENT.—M. C. Hall and J. E. Shillinger,⁴ encouraged by the success of the former in discovering carbon tetrachloride, have examined a number of allied compounds, and now describe a new anthelmintic in **Tetrachlorethylene**, which is apparently as effective as the former preparation, and may be slightly more so, as judged by trials in dogs in doses equivalent to 2 to 3 c.c. in man, with about the same degree of safety. The cost at present is two to three times as great, but could be reduced if made on a large scale to about the same price as carbon tetrachloride, while it would not require a purge and is more pleasant in taste and odour than the former drug. It is therefore recommended for trial in man.

K. S. Mhaskar⁵ publishes a lengthy report on his Madras field investigations of the treatment of ankylostomiasis from July, 1916, to January, 1923. He found infection of a mild type in 98.6 per cent of the coolies examined and 91 per cent in urban areas, with an average of only 22 worms per person. *Oxyuris* infection was also almost universal—99 per cent—the infection being greatest in the most humid areas. In spite of common absence of symptoms in these mild infections, the elimination of the worms led to increase in weight. Diagnosis of the ova was best made by the flotation method. Contrary to most workers, he regards **Beta-naphthol** in a single dose of 50 gr., without a purge, as giving the best results (90 per cent of hookworms being removed), and as most suitable in the field, being an efficient method which need not be repeated, as the removal of the last worm is neither essential nor practicable; *santonin* is required in addition if round worms are present. As reinfection cannot be prevented in the insanitary conditions of India, annual treatment in the monsoon months is necessary to maintain health.

A. C. Chandler and A. K. Mukerji⁶ report on **Carbon Tetrachloride** treatment in Calcutta, and find 3 to 5 c.c. of the chemically pure drug, accompanied or followed by a saline purge, to be as safe as or safer than any other effective anthelmintic in non-alcoholic patients, given a diet rich in carbohydrates and poor in fats to protect the liver from fatty changes; 70 to 90 per cent of *Necator* infections were cured by a single dose, but only 30 to 40 per cent of *Ankylostoma* infections, the former predominating in India. It is very simple to administer, and very cheap, and they advise its use in 70-min. doses in skimmed milk, with or without a subsequent saline purge, at a cost of one-half to three-quarters of a penny per case. In a later report⁷ the same workers state that they have treated 70 cases in the hospital of the Calcutta School of Tropical Medicine with 60 min. of carbon tetrachloride in milk combined with 15 min. of **Oil of Chenopodium** in a capsule in adults, which they find as safe as either drug separately, while it acts well on *Ankylostoma* and *Ascaris* as well as on *Necator* worms; they think, however, that a smaller dose might

be advisable in the field. W. G. Smullic and S. B. Pessoa⁸ advise giving in the early morning, on an empty stomach, 2 c.c. of a mixture of 4 parts of carbon tetrachloride and 1 of Ascaridol, the active principle of oil of chenopodium, in freshly prepared hard capsules, this being the dose for adults; while in children 2 min. of the mixture for each year of age up to a maximum of 2 c.c. is advised. This is followed two hours later by a purge of magnesium sulphate, 93 to 95 per cent of all hookworms being removed inexpensively without any unpleasant symptoms. The carbon tetrachloride acts best on *Necator*, and ascaridol on *Ankylostoma*.

REFERENCES.—¹*Ind. Med. Gaz.* 1924, Nov., 533; ²*Ibid.* 1925, May, 105; ³*Amer. Jour. Trop. Med.* 1925, July, 291; ⁴*Ibid.* May, 229; ⁵*Ind. Jour. Med. Research*, 1924, Oct. (Supp.); ⁶*Ind. Med. Gaz.* 1925, Feb., 61; ⁷*Ibid.* April, 145; ⁸*Amer. Jour. Trop. Med.* 1925, Jan., 71.

ANUS, CHANCRE OF.

J. P. Lockhart-Mummery, F.R.C.S.

This is a rare condition in this country as judged by the number of cases seen in the St. Mark's Hospital clinic, not more than one case of anal chancre at the most being seen in the 1500 new cases attending the hospital each year. E. Martin and H. Kallet¹ report 25 cases out of 300 patients attending the proctological clinic at Detroit. All the cases were in young adults, and had presumably resulted from the practice of sodomy. The commonest position of the sore is at the posterior commissure of the anus. It begins as an indolent ulcer with a hard base. There is often considerable surrounding inflammation, and the median raphé is often red and swollen. The condition soon becomes somewhat obscured by the formation of secondary condylomata and sepsis, and as it is often at this stage that the case is first seen the diagnosis is not always easy. Pain is not a marked symptom, and most of the patients seek advice on account of discomfort. Treatment consists of the usual antisyphilitic measures. In this country the incidence of the condition is not nearly so frequent as disclosed by this report; but it is very important that medical men should be able to diagnose the condition when first seen, as it is highly infectious, and those attending the case, both doctors and nurses, run a serious risk of infection if the nature of the condition is not suspected at once. The accompanying illustrations (*Plate III*) taken from the paper quoted give a good idea of the appearances.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1925, May 23, 1556.

ANUS, PRURITUS OF. (See PRURITUS ANI.)

AORTA, DISEASE OF. (See ANEURYSM; ARTERIOSCLEROSIS; BLOOD-PRESSURE; HEART, EXAMINATION OF—ELECTROCARDIOGRAPHY; SYPHILIS, CARDIOVASCULAR.)

APPENDICITIS, CHRONIC, X-RAY EVIDENCE OF.

Robert Hutchison, M.D., F.R.C.P.

Friedman,¹ as a result of his radiographic studies on this subject, concludes that chronic appendicitis may be shown by: (1) Visual absence of appendix; (2) Concretions; (3) Local area of tenderness in the course of the appendix shown on röntgenoscopic examination, providing other irritative centres in that region have been ruled out; (4) Retention of the barium meal in the lumen of the appendix for several days after the lower cæcum is empty despite a laxative; (5) Irregularities in the lumen, particularly a bulbous tip; (6) Adhesions about the cæcum and the terminal ileum, indicating inflammatory processes.

REFERENCE.—¹*Med. Jour. and Record*, 1924, Oct. 1, 110.

PLATE III.
CHANCRE OF THE ANUS

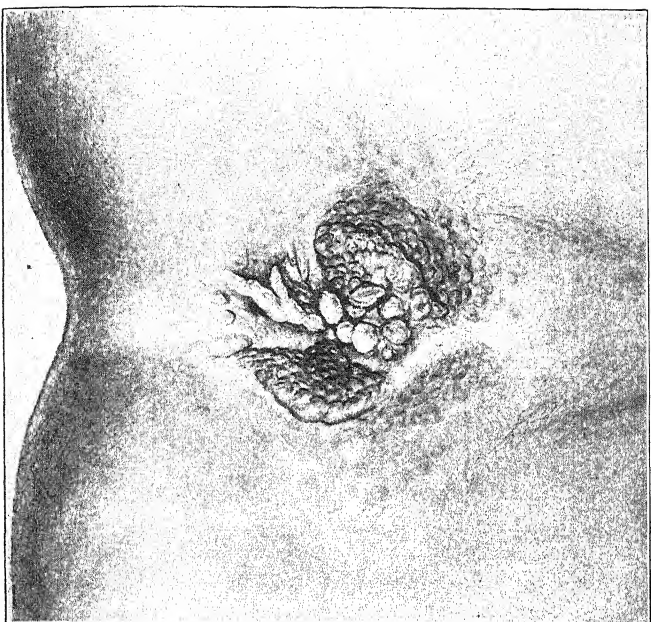


Fig. A.—Chancere becoming obscured by condyloma; papule formation at the periphery.

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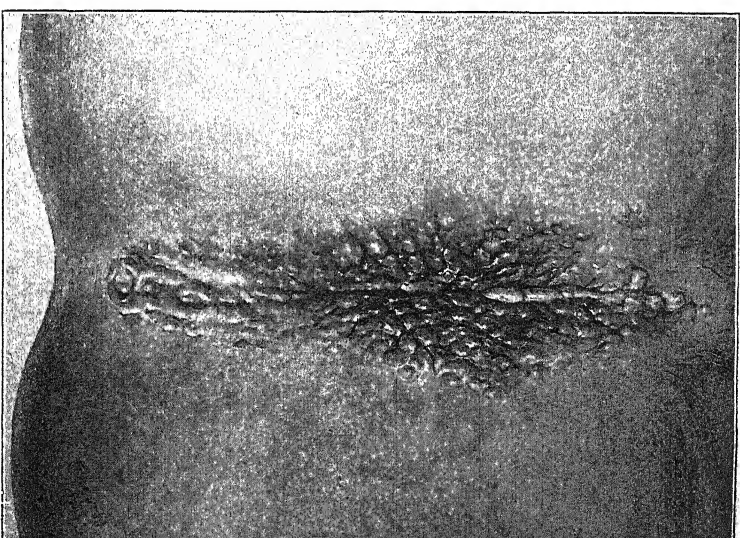


Fig. B.—Diffuse and early condyloma developing four weeks after initial lesion. Spirochaetes were demonstrated throughout the involved area. The Wassermann reaction was negative.

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APPENDIX, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.
Edmund Andrews, M.D., F.A.C.S.

The rôle of *intestinal parasites* in the production of disease of the appendix has long been discussed, but little real scientific evidence has been presented. Findings of worms in disease have little significance, unless we know more than we do about the normal incidence of such infestation. Pathologists from different parts of the world report that from 6 to 40 per cent of appendices removed at operation contain parasites, but this means nothing unless we know how many normal appendices contain them. W. H. Harris and D. C. Browne¹ and H. Steichele² each report definite pathological changes brought about by these invaders. *Oxyuris vermicularis* was the offending agent in each study. These observers not only found that the lumen of the appendix was infested with worms, but were able to demonstrate that they had penetrated the mucosa and tunnelled through the tissues, making possible entry points for infection. This fact has been overlooked because we had not made careful enough microscopical studies of the excised organs. This penetration of the walls is shown by each of the observers to be rather common. The American workers believe that not only is acute disease often initiated in this manner, but a high percentage of the chronic and recurrent cases are due to this cause. The inflammation set up is often not violent, but is more of the catarrhal type, gradually producing fibrous changes and atrophy of the mucosa, and at times of the whole organ. Steichele thinks the clinical picture of this condition is clear enough to permit diagnosis before operation in many cases. The movements of these worms through the tunnels sets up hyperperistalsis of the appendix and the adjacent bowels, giving rise to mild, poorly localized abdominal pain at irregular intervals. In Germany the difficult economic conditions following the war have brought on a great increase in the incidence of oxyuris infestation, and the subject now presents a growing problem.

The subject of *chronic appendicitis* is still a very live one in surgical circles. A few years ago the disappointing results of surgery on the 'cold' appendix were brought forward by several American surgeons. Some went so far as to doubt the existence of any such clinical entity as chronic appendicitis. This without a doubt was an extreme view, but the whole discussion has brought about a healthy spirit of caution on the part of the surgeon, and prevented many unnecessary operations. This year M. Brulé's paper³ on this subject caused considerable protest from other French surgeons. He took a rather radical view, and came to the conclusion that most chronic pains in the right iliac fossa were due to other causes, and that the diagnosis of appendicitis in these cases should be made with great caution. J. L. Faure,⁴ although agreeing with some of his statements, called attention to the difficulties of making accurate diagnosis in such cases, and feared that such teaching would bring about the neglect of many appendices which constituted a grave menace to the individual, not only on account of the chronic pain, but also from the danger of acute attacks. C. Flandin⁵ expressed the same sentiments, and said, "I have never regretted having removed an appendix; I have often repented having left one". This point of view is quite reasonable in the absence of definite indications and contra-indications for operation, but a considerable literature now exists on this subject, and accurate methods of diagnosis are now available.

Five years ago C. L. Gibson⁶ reviewed a series of such cases, showing how poor the after-results were when appendicectomy was done on too slight provocation. At that time he analysed the causes of failure and drew up a set of indications to follow which he thought would improve his percentage of good results. These rules follow: (1) A comprehensive and detailed history. (2)

A complete and thorough physical examination, including all refinements of diagnosis. (3) Exercise caution in undertaking operation on women as compared with men. (4) Exercise caution particularly in the more mature patients, and in women. In this class other lesions may coexist or may be mistaken for appendicitis. (5) Avoid the neurasthenics of any age or sex. (6) Exercise particular restraint when there is no clear and reliable history of well-defined attacks, particularly of localized pain accompanied by nausea or vomiting. (7) Make a good-sized incision, and, even if a frankly pathological appendix is found, look for other possible lesions. (8) If no obviously pathological appendix is found, do not cease looking for other lesions until every other possibility has been exhausted; make a supplementary incision if necessary. He has now collected a similar series of cases⁷ in which all these rules were rigidly adhered to, and the results speak for themselves. (Note: In the second series the unsatisfactory results have been cut down 50 per cent).

APPENDICECTOMY: COMPARISON OF TWO PERIODS.

Results	Jan. 1, 1913, to July 1, 1919			July 1, 1919, to Jan. 1, 1924	
	No.	Per cent		No.	Per cent
Excellent ..	259	46.0	58	283	62.0
Satisfactory ..	65	12.0		105	23.0
Unsatisfactory ..	102	18.0		41	9.0
Unknown ..	126	23.0		22	5.0
Deaths ..	3	0.5		3	0.7
Total ..	555			454	

These conclusions are concurred in by H. W. Bettmann,⁸ who gives an analysis of the causes of failure in 170 cases of so-called chronic appendicitis. The overwhelming preponderance due to very inadequate study of the patient and very imperfect indication for any operation amply confirms the stress laid on case study by Gibson.

Another point he emphasizes is the location of pain. Cases complaining only of pain in the right iliac region should always be suspect of being spurious. The pain in chronic appendicitis is more often referred. Epigastric or umbilical pain is very common. Dyspepsia is the rule. This fact is perhaps the greatest single source of error. Those cases with right side ache include the neurasthenics, the colitis cases, the salpingitis cases, and almost everything but the true appendicitis. Localized tenderness but referred pain is the rule in the true chronic appendicitis.

This author also mentions that 6 per cent of the errors in his table are due to faulty X-ray reports. He insists [and in this the reviewers are in heartiest accord] that radiological examination of the appendix is practically worthless. Whether an appendix fills or not is pure chance. If it is already full of feces it will surely not admit any barium. Whether it emptied itself in any stated length of time has no pathological significance. The pathologist will tell us that very few appendices are histologically normal; therefore correspondence between the pathological and the radiological reports is of slight moment. The fact of tenderness on palpation in the X-ray room is also meaningless; almost any appendix when it is distended with barium will be tender. These facts should be recognized once for all. No radiologist has the right to make the diagnosis of chronic appendicitis.

A similar study by Irwin⁹ arrives at the conclusion that chronic appendicitis as a cause of obscure abdominal pain is a rarity, and this diagnosis should be made only after all our means of study have been exhausted.

In a series of papers by three distinguished British surgeons a unanimity in favour of the expectant treatment in the middle stage of acute appendicitis is expressed. Sherren¹⁰ was one of the pioneers in this matter, and in common with Ochsner and Murphy on this side of the ocean was subjected to much abuse for his views. The excellent result from this method of management in the wards of the London Hospital have been of great value in convincing the profession of the superiority of expectant treatment in certain stages of this disease. The indications for operation given by Sherren,¹⁰ Rendle Short,¹¹ and R. P. Rowlands¹² are almost identical. In early cases where the infection is limited to the appendix (say within the first forty-eight hours of the attack), immediate operation is imperative. In all old cases where localization has occurred, drainage of the abscess is indicated. In the intermediate stage, the use of considerable judgement is required. If there is evidence of great toxæmia, spreading peritonitis, or profound shock, a preliminary course of medical treatment is of great value. The patient has time then to build up his antibodies to the toxins. Adhesions form and walling off occurs. Complete resolution is likely, and in that case an interval operation is possible which carries almost no mortality or danger of hernia formation. Finally, we shall not spread the infection to new areas by our operative manipulations. During this critical time supportive treatment is given. Morphine not only controls the pain and helps to combat shock, but limits intestinal movements so that there is less tendency for the infection to spread. Fluids are administered freely to dilute the toxins and increase elimination. They are administered by the rectum, by vein, or under the skin, but sparingly by mouth. Food is withheld until vomiting and pain subside.

Attention is called by all the above surgeons to the fact that the appendicitis problem is far from being solved yet. Not only is the incidence of the disease increasing (possibly due to lack of cellulose in the diet—Short), but more people die from it each year. These figures apply both to Europe and America. The greater frequency of the disease more than makes up for the lesser operative mortality as our surgical and diagnostic skill increases.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, Feb. 28, 650; ²*Arch. f. klin. Chir.* 1925, April 2, 375; ³*Presse méd.* 1924, Nov. 12, 893; ⁴*Ibid.* Nov. 19, 913; ⁵*Ibid.* Dec. 24, 1026; ⁶*Amer. Jour. Med. Sci.* 1920, clix, 654; ⁷*Ibid.* 1924, Dec., 807; ⁸*Jour. Amer. Med. Assoc.* 1924, Oct. 18, 1216; ⁹*Clinical Jour.* 1925, Feb. 25, 85; ¹⁰*Brit. Med. Jour.* 1925, i, 727; ¹¹*Lancet*, 1925, i, 215 and 269; ¹²*Guy's Hosp. Rep.* 1925, Jan., 69.

ARRHYTHMIA, CARDIAC. (See HEART, ARRHYTHMIA OF.)

ARTERIOSCLEROSIS. (See also BLOOD-PRESSURE; EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

J. E. MacIlwaine, M.D.

S. B. Boyd Campbell, M.D.

The following quotations are from the late Sir T. Clifford Allbutt's¹ essay on arteriosclerosis: "The provisional conclusion seems to be that wear and tear, normal and abnormal, acting upon vessels of various original quality, is largely concerned in the production of atherosclerosis, yet notwithstanding, even in hyperpiesia and senile atherosclerosis there is reason to suspect a frequent co-operation of causes of an infective kind; and in certain maladies an infective cause is sole or predominant. . . . So far as the media is concerned, the kind of change which occurs I have called 'involutionary' or 'decreascent', adjectives to which Dr. Geoffrey Evans demurs, as they seem to exclude infectious factors. Other authors of consideration are approving and using the term 'decreascent', and surely the senile factor is a large and common one."

G. Evans² considers there is real reason to regard arteriosclerosis as a recovery, and thinks it is necessary to recognize the active condition. Thus

he talks of arteriosclerotic disease as an active arteriosclerotic lesion. He bases his opinion on the morbid anatomy of arterio-capillary fibrosis or diffuse hyperplastic sclerosis. He considers that the active stage is inflammatory, and that it is followed by a degenerative later stage. In discussing the symptomatology of the disease he takes as a cardinal sign hæmorrhage, and as the cardinal symptom pain. He considers that this inflammation of the arteries is largely responsible for cerebral and other hæmorrhages. He thinks that trauma, high blood-pressure, and senility have had too much importance attached to them.

High Protein Diet and Intestinal Infection as Etiological Factors in Arteriosclerosis.—N. M. Alter³ considers that arteriosclerosis, as known clinically, is a disease of old age. The experiments reported in his paper show evidence in favour of the injurious effect that a high protein diet has on the intima of the vessels. Infections have been also proved important factors in the production of the disease. In the experiments attempts were made to study the effect of intestinal infections. A high protein diet with abnormal proteolysis, as affected by a changed intestinal flora, may result in absorption of toxic proteolytic substances that are chiefly responsible for the fatty degeneration of the intima. The most extensive lesions in the experiments were produced by the combination of high protein diet and feeding with a virulent strain of *B. coli*. Pure high protein diet without feeding of organisms has also proved effective in the production of atherosclerosis, although less marked in degree.

Incidence of Atherosclerosis.—From the results of 1099 autopsies F. Schubert⁴ remarks that atherosclerosis causes disease and cuts life short. He mentions that Beneke, fifty years ago, noticed the combination of atherosclerosis, obesity, and gall-stones. Post-mortems show atherosclerosis in 40 per cent, 1.6 per cent in the second decade, rising to 88 per cent in the seventh decade, and 50 per cent at the climacteric. In 36 per cent of the atherosclerotic cases (14 per cent of the total cases) atherosclerosis with its direct result was the cause of fatal disease; this rises from 17 per cent in the third decade to 45 per cent in the eighth decade. In 64 per cent (25 per cent of the total post-mortem material) atherosclerosis was an associated finding. It can therefore be said that arterial sclerosis accompanies man from his early youth to advanced age, and can—at first only a rare occurrence—almost be designated as the rule in old age, which fact obviously gives it the appearance of a physiological occurrence. It only gains a special importance, however, after the time of the climacteric, on the importance of which Beneke has given detailed information. When differentiating according to extent and intensity, Schubert remarks on the special danger of peripheral arterial sclerosis in early life, especially with resultant disease of the kidneys. On the other hand, we see a relatively harmless course taken by the central form of arteriosclerosis, which only sets in in later life. Arterial sclerosis in women is considerably rarer, the proportion being especially demonstrated in observation of coronary sclerosis, with its consequences. He agrees with the above-mentioned observations of Beneke on the association of the combination of arterial sclerosis, obesity, and gall-stones, and the relatively frequent participation of the female sex. He notes that a similar connection can also be proved relating lymphatism to obesity and arterial sclerosis. He indicates also a connection between arteriosclerosis and constitutional conditions.

'Attenuated' Abdominal Aortitis of Gastric Form.—Gutmann and Routier,⁵ writing on this condition, think that the mild form with slight but repeated daily pains, similar to gastric affection, is more frequent than the severer gastric type of aortitis. The stomach seems to be the cause; all complain of

epigastric pains—a slight attack accompanied with feeling of fullness and tension after a meal, and a more severe one three or four hours after, difficult to localize or describe. The pain is often described as constrictive, but is not of abdominal anginal type. Alkaline or acid ingestions sometimes diminish, change, or increase, but never abolish the pain. There is hæmatemesis or vomiting, but fairly often constipation, diarrhoea, colic, and glairy stools. At other times effort or fatigue will bring on an attack, and sometimes patients have vague disagreeable feelings between attacks, which occur regularly every day after each meal, and not at intermittent periods.

DIAGNOSIS.—The condition is difficult to diagnose. Increased aortic beats are too general to be of value. Localized epigastric resistance indicates a painful inflammatory process, but not its origin. Pain on aortic pressure is important. The aorta is often enlarged and mobile, and in thin patients irregularities of its wall may be felt. In certain cases due to rigid aortic walls the femoral pulse may be felt before the radial. *Radiological examination* shows an enlarged aorta lying on the left of the middle line. Diagnosis is reached by elimination of other painful conditions in the upper abdomen.

ETIOLOGY.—Syphilis was suspected in two cases and proved in only one. In many cases neighbouring lesions are the cause of the aortic and peri-aortic reaction—the peri-aortic reaction being the commoner lesion. Different theories of pathogeny are: (1) Ischæmia of arteries provoking gastric intermittent claudication; (2) Vascular crisis; (3) Neurosis of solar plexus. The time and method (two paroxysms) of the occurrence of pain are important. Loeper shows that tension has three variations after meals: hypertension immediately after food; hypotension half to three-quarters of an hour later; more marked hypertension two to three hours later. This raising of pressure distends inflamed tissues and plexus, causing pain.

TREATMENT.—General, such as intensive Iodide Medication, Diathermy, and Sun and Light Baths. In one syphilitic case treated for two years with mercury, bismuth, and arsenobenzenes, there was no relief in pain until Charrier performed Gastric Enervation, when immediate and permanent relief followed.

REFERENCES.—¹*Arteriosclerosis*, Macmillan & Co. Ltd., London, 1925; ²*Brit. Med. Jour.* 1924, ii, 1; ³*Colorado Med.* 1925, June, 199; ⁴*Wien. klin. Woch.* 1924, July 31, 751; ⁵*Presse méd.* 1925, Jan. 7, 20.

ARTHROPLASTY. (See JOINT SURGERY, RECONSTRUCTIVE.)

ASTHMA.

W. II. Wynn, M.D., F.R.C.P.

There is a tendency among some English authorities to minimize the 'sensitization' factor in asthma and to stress the nervous origin. Langdon Brown¹ defines asthma as due to an unstable or irritable condition of the bronchomotor and vasomotor portions of the vagus nucleus, which causes it to react unduly to psychical or peripheral stimuli or to foreign proteins in the circulating blood. A. F. Hurst² holds a similar view. These theories seem to exaggerate the nervous mechanism of asthma, as we know experimentally that if the lungs of a sensitized guinea-pig are removed from the body and washed free from blood and then perfused with a solution of the protein, a spasm is set up so tight that air cannot be forced in or out of the lungs. Langdon Brown includes under peripheral stimuli the influence of eye-strain, hay fever and other nasal troubles, sinus infection, gastric and intestinal disturbances, and uterine disorders. But with hay fever we have a toxin acting locally, and with sinus infection and gastric and intestinal disorders it is difficult to believe that they act by reflex stimulation and not by the production of toxins, bacterial or otherwise. There is much difference of opinion also upon the value of skin tests. F. Coke³ obtained 58 per cent of positive dermal

reactions in a series of 500 consecutive cases, whereas E. P. Poulton agreed with Van Leeuwen that skin reactions were of no value in diagnosing the cause of the asthmatic attacks, and A. F. Hurst had hardly ever obtained a positive reaction in an adult except with pollen.

F. G. Chandler⁴ discusses the *technique of skin tests*. He has found certain commercial test proteins inert. He finds that group testing is efficient if the solutions are not too weak, and that it is necessary in order that a sufficient number of proteins be tested. He prepares his proteins as follows: (1) Allied substances are ground up together and macerated in water with some crystals of thymol (e.g., all the common flat-fish or all the common shellfish). This is then filtered, the filtrate evaporated to dryness at 56° C. over a water-bath, and the resulting powder ground up. This, used with decinormal soda, makes a good group test powder. (2) Many proteins, treated in this way, produce a gummy syrup which cannot be desiccated. In this case the mass is redissolved in water and precipitated by alcohol, or acetone, filtered, and the precipitate dried in alcohol or ether. (3) The proteins are prepared separately in powder form, and then mixed in equal quantities and dissolved or suspended in water or centinormal soda with 1-4 per cent carbolic acid. Such a solution is effective, and will remain active for three or four years. (4) A simpler method which is being investigated further is to boil several foodstuffs together and test with the filtrate.

Eggston⁵ considers that the skin test is one of the most satisfactory procedures available for ascertaining the cause of disease. In the bacterial type of asthma he uses intradermal injections of freshly prepared autogenous vaccines. In the positive cases there are itching, redness, and œdema at the site of injection, followed in twenty-four to forty-eight hours by a painful congested area with induration of the skin varying from 1.5 to 8 cm. in diameter. Control tests were done with other vaccines. He has obtained encouraging results with these tests in demonstrating the relationship of a focus of infection to toxæmia.

W. S. Thomas, L. W. Famulener, and M. D. Touart⁶ find that a little over one-half of all asthmatic patients give positive reactions to air-borne or food proteins. They have studied dermal reactions to bacterial proteins, and found that several patients gave positive reactions to autogenous vaccines, and were entirely relieved by vaccine treatment as indicated by the reactions to vaccine tests. A thorough and exacting bacteriological examination of materials from all possible foci of infection is first made, attention being directed chiefly to material from the nose and accessory sinuses, infected adenoids, tonsillar material from the crypts, sputum from the deeper air-passages, also the feces. Other possible sites should be considered: apical teeth abscesses, gall-bladder, endometrium, seminal vesicles, prostate, and urinary tract. Fresh autogenous vaccines were made from each likely type of organism. Standardization was effected by accurate measurement by volume of the packed moist organisms in a special centrifuge tube. A 1 per cent suspension of the packed residue is prepared in normal saline. For intradermal injection 0.01 c.c. of a 1 per cent suspension was used. Scratch or dermal tests were found to be unsatisfactory. As a control the same diluent of normal saline with cresol was used. Positive reactions were of two types: (1) An early reaction, appearing in from ten to thirty minutes and soon thereafter fading; (2) A late positive reaction noticeable in twenty-four hours or less, and at its height on the second day. It persists for two to five days, and occasionally for several weeks. The early positive reaction is a wheal at least 1 cm. in diameter, with pseudopodia or grossly irregular outline, sharply marked off from a surrounding pink areola. Early positive reactions were seen in 25 per cent of asthma and hay-fever

patients, but rarely in other cases. The late positive reaction is not unlike the Schick reaction in appearance, but to interpret its significance the component features should be noted by touch as well as by sight, and recorded graphically day by day. Any of the following features may appear about the point of injection during the first twenty-four hours, and may persist for five or more days: (1) An indurated, slightly raised nodule, usually about 0.5 cm. in diameter; (2) Redness of the skin over the nodule; (3) A surrounding pink flush or zone of erythema from 1 to 10 cm. in diameter; (4) Tenderness on pressure; (5) Heat to the finger; (6) Lymphangitis, lasting from one to three days; (7) Slight fever and malaise; (8) Pustule, sterile and occurring very rarely. Staphylococci and streptococci regularly, but intestinal bacilli less often, induced the indurated nodule. Positive reactions to bacilli of the colony-typoid group give hot large areolae which fade in two or three days. Positive reactions, whether early or late, are regarded as of equal importance as indications for the use of the vaccines which produced them.

W. F. Moore⁷ has studied 27 cases of asthma *bronchoscopically*. Cases were found to fall into two groups: (1) Those with bronchoscopically evident active suppurative tracheobronchitis; (2) Those with evident chronic passive congestion. In the first group, infection seemed to be responsible for the condition, and in the second, factors outside the bronchi. G. R. Moffitt⁸ at the same clinic has studied *ciliary movement* in cases of asthma. He finds that there are as many as 480 cilia attached to a cell instead of the 12 to 25 given in text-books. The ciliary movements are at the rate of 6 per second. The cilia are 18 to 20 micra long. In asthma the following changes were noted: (1) Loss of the ciliary movement which produces a current; (2) Complete loss of ciliary motion; (3) Actual loss of the cilia; (4) Fatty degeneration of the cell. His observations lead him to believe that replacement of cilia or ciliated cells, lost by disease, can take place.

TREATMENT.—W. S. Thomas and M. D. Touart⁹ have treated 62 cases of asthma with **Autogenous Vaccines**, the vaccines being chosen by testing as above. In all cases other remedial measures had previously been used fully. It not infrequently happened that definite clinical improvement was noted within a few hours after the preliminary testing. Occasionally only one organism was used in the vaccine, but more often two or more gave sufficiently active reactions to be included. They aimed at producing in healthy tissue, at frequent intervals, a local reaction characterized by slight swelling and tenderness, and perhaps erythema of the overlying skin, lasting from one to five days. The initial dose was approximately 100 million organisms, and if this dose produced a local reaction it was repeated at intervals of two or three days until none followed. The amount was then increased by 100 million until the desired result appeared. The dose seldom exceeded 400 million. As the asthma improved, the interval between doses was increased to five, and later seven, days. In a few there was rapid and uninterrupted recovery; but the usual course was gradual improvement, varied from time to time by exacerbations of asthma. In most the vaccines were stopped as soon as relief of symptoms occurred, but more recently patients have been treated with weekly, bi-weekly, or monthly doses long after clinical relief occurred. The duration of treatment varied from one to ten weeks and averaged six weeks. If symptoms occurred in spite of treatment, fresh cultures were made, and at times showed an organism not found previously. The results obtained were: relieved, 32; much improved, 14; recent, relieved by treatment, 8; failures, 8.

A. G. Auld¹⁰ states that in the thousands of injections of **Peptone** he has made there has never been a single accident, and he claims intravenous injection to be quite safe. For intravenous injection he advises beginning

with 5 min. of a 5 per cent solution of Armour's No. 2 peptone, injecting twice a week and increasing each time by 3 min. until 26 min. (1.5 c.c.) are reached. This last dose is injected twice more. By this time three classes of cases will be found—in one the patient is quite well, in another he is much better but not yet well, and in a third he is but little better. In the first class it is only necessary to increase the dose by about 4 min. for two more doses, and then give weekly 25, 20, 15, and 10 min. In the others, if the patient is taking the peptone well, the dose should be increased to 2 c.c., then 2.5 c.c., or even 3 c.c., and then reduced by about 10 min. each time to 33, 23, and 13 min. If, however, during this time he has an attack of asthma, the dose should be reduced considerably, say to 25 min. This is continued for two or three weeks and then reduced weekly to 15 and 10 min. Each case requires careful watching, and sometimes the administration of Thyroid Extract or Iodine or Ovarian Substance. Auld also uses Serum Peptone. It has been found that when the patient's blood is incubated with peptone *in vitro* a change occurs in the serum and the peptone which renders the mixture suitable for the treatment of asthma. Anaphylatoxin is produced. The peptone solution is prepared by making a 10, 15, or 20 per cent solution in normal saline, 10 c.c. Blood is allowed to flow from a needle inserted into a vein at the elbow into the peptone tube until 30 c.c. are obtained. The tube, well sloped, is then incubated at 37° C. for a few hours or until the serum has separated out. It is then removed, and kept at room temperature until next day; the serum peptone is then poured into a bottle. If acid, it is neutralized with soda and 0.5 per cent phenol added. From the 40 c.c. about 14 to 18 c.c. serum peptone will be obtained. The 10, 15, or 20 per cent solutions of peptone are used according to the case. With weakly delicate persons the 10 per cent is used. The serum peptone is injected intravenously twice a week in doses of 0.5, 1.0, 1.5, 2, 2.5, 3 c.c. If the higher doses produce a reaction, the dose is slightly reduced. Then 2.5 or 3 c.c. are given for two weeks, then 1.5 c.c. for one week, and 1 c.c. the next week. Variations in these doses may be required.

A. F. Hurst¹¹ finds that 1 min. of 1-1000 Adrenalin Chloride is usually sufficient to relieve an attack, provided that it is injected promptly. He rarely found more than 3 min. required; 15 min. might produce tachycardia, tremor, and a feeling of collapse, whereas 1 or 2 min. would abort an attack without rise of blood-pressure. In cases of status asthmaticus, in which the patient was in a state of continuous severe asthma for hours or days, the attacks could be stopped by the continuous administration of adrenalin. After injecting 3 min. the needle was kept in position, and 1 min. was injected every quarter of a minute until relief occurred. As many as 40, 50, or 60 min. might be required. These large doses produced no unpleasant symptoms, although 5 min. in one dose might have caused tachycardia.

REFERENCES.—¹*Brit. Med. Jour.* 1925, ii, 367; ²*Ibid.*; ³*Ibid.*; ⁴*Lancet*, 1925, i, 1177; ⁵*Jour. Amer. Med. Assoc.* 1924, Oct. 18, 1221; ⁶*Arch. of Internal Med.* 1924, July, 85; ⁷*Amer. Jour. Med. Sci.* 1925, June, 799; ⁸*Ibid.*; ⁹*Arch. of Internal Med.* 1924, July, 79; ¹⁰*Brit. Med. Jour.* 1925, i, 448; ¹¹*Ibid.* ii, 371.

AURICULAR FIBRILLATION. (See HEART, ARRHYTHMIA OF.)

BACKACHE OF PELVIC ORIGIN.

W. E. Fothergill, M.D.

Formerly, a woman with backache was considered to be the peculiar property of the gynaecologist, but the pendulum has now swung in the other direction, and large numbers of these cases are claimed by the general physician and the orthopaedic surgeon. Daniel Dougall¹ writes that 129 hospital patients in a gynaecological clinic were asked specifically if they had backache, and 43 per cent answered in the affirmative. This was in response to a leading question,

and doubtless includes many cases in which the pain was not important. Dougal studied the case cards of 1000 patients, and found that 235 cases (about 23 per cent) complained of backache. He has analysed these cases. Gynaecological backache is generally sacral, sometimes on one side, sometimes on both, and is often associated with pain in the lower abdomen, less often with pain down the thighs. It may be constant, or may follow exertion. It is often associated with menstruation, and may be stated to have commenced shortly after a confinement. The pelvic lesions with which backache was associated in Dougal's cases were genital prolapse, chronic inflammation of the uterus, adnexal and peri-uterine inflammation, fibroids, adenomyomata, cancer of the cervix, and ovarian tumour. The cases were 'followed up', and the replies from 152 patients taken as a whole showed that 73 per cent of the backaches associated with these lesions were cured or much relieved by the appropriate surgical treatment, and that in 45 per cent the pain completely disappeared after operation. The genital prolapse group contained 66 patients, of whom 51 replied: no backache since operation, 30; much improved, 12; no better, 9. Thus in this group the results are distinctly good, the pain being cured or much relieved in 80 per cent of the cases. Dougal concludes that chronic backache is an important symptom amongst gynaecological patients, being present in from 20 to 30 per cent of all cases. It has little diagnostic value, however. The importance of this symptom in uncomplicated retroversion and retroflexion has been much exaggerated, as it is found almost as frequently when the uterus is in a forward position. The most important factor in producing backache is fatigue of the pelvic-floor muscles, and this may result from increased weight of the uterus, but more frequently from stretching of the parametric tissues.

[To the list of pelvic lesions mentioned by Dougal I would add one, namely, pelvic varicocele, for patients with no displacement, no inflammation, and no new growth, but with distended varicose veins in the broad ligaments very often complain of sacral backache. (See VARICOCELE, PELVIC.) As a hint in diagnosis I would mention that many patients with a gynaecological lesion have also a sacral pain or backache which has nothing to do with the gynaecological lesion. This should be explained before treatment is undertaken; for if this is not done, the gynaecological lesion is cured but the backache is left and disappointment is caused. As an example, take what we used to call rheumatism in the region of one or both sacro-iliac joints—a sort of lumbago rather low down. Many women have this ailment, and so do many men. It does not disappear after pelvic operations. Much sacral pain, in men and women alike, is relieved by keeping the bowels loose. In the words of a patient, "One cascara a day keeps the backache away".—W. E. F.]

REFERENCE.—¹*Lancet*, 1924, ii, 1220.

BERI-BERI.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—R. McCarrison¹ has published a fuller account of the work discussed in last year's MEDICAL ANNUAL, indicating some poison in rice in addition to vitamin deficiency, a conclusion supported by J. W. D. Megaw in a paper reviewed in the same issue. H. W. Acton and R. N. Chopra² have now recorded three years' investigations lending important experimental evidence to his view of the etiology of beri-beri and epidemic dropsy, which they regard as different clinical aspects of disease produced by the ingestion of poisonous bases formed in parboiled or decorticated rice stored during hot damp weather, and produced within the rice grains by the action of an invading spore-forming bacillus of the *B. vulgatus* group, which was demonstrated in sections of the rice grains and cultivated, and which produces in sterile rice

medium under aerobic conditions water-soluble bases, while under anaerobic ones, at a temperature of 50° C. only, a neurotoxin is also produced. The water-soluble toxin produces epidemic dropsy; and the neurotoxic one, soluble only in alcohol, beri-beri symptoms seen in persons cooking for themselves. Tracings are given showing that these bases can produce œdema, heart effects, and parasympathetic paralysis, while they are not formed in uninoculated control rice media. Individual susceptibility influences the distribution of the disease in a population consuming the diseased rice, and rice polishings are said to contain substances antagonistic to those of diseased rice; while the pericarp of undecorticated rice protects against the bacterial invasion of the grain, polished parboiled rice being the most dangerous. Adrenalin in 2-min. doses injected twice a day relieves œdema and antagonizes the water-soluble bases.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1924, Oct. (Supp. Mem. No. 2); ²*Ind. Med. Gaz.* 1925, Jan., 1.

BILHARZIASIS. (See SCHISTOSOMIASIS.)

BLADDER, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

Vesical Nerve Lesions.—W. F. Braasch¹ states that the cystoscopic findings which have proved most valuable in the recognition of lesions of the vesical nerves are trabeculation, relaxation of the urinary sphincter and prostatic urethra, and disturbed sensation. Two distinct types of cystoscopic picture are recognized. In the first type, seen in cases presenting definite clinical evidence of involvement of the central nervous system, marked relaxation of the internal sphincter and prostatic urethra, fine ridge-like trabeculations confined largely to the dome, and diminution in sensation of the urethra and bladder, are found in typical instances. Such is the classical cystoscopic picture seen in tabetic bladders, which form the largest group of cases coming under this heading. The second type, that of the so-called 'atonic' bladder in which there is no evidence of any lesion of the central nervous system but in which paralysis of the motor nerves of the bladder appears to be present, a condition first described by Thomson-Walker and ascribed by him to a localized lesion in the hypogastric plexus, is subdivided by Braasch into two groups: (1) The more common, in which there is motor disturbance alone; and (2) Cases with both motor and sensory disturbance or even with sensory disturbance alone. Cystoscopic examination of the 'atonic' bladder shows the musculature to be flabby and with complete loss of tone; trabeculation is not so marked as in the tabetic bladder and may be absent; dilatation of the sphincter, when present, is slight, and diminution of sensation in the prostatic urethra may or may not be present. The expulsive power of the bladder is in great part or entirely lost, and its estimation by means of a manometer may give data which are of distinct clinical value in cases in which the possibility of prostatic obstruction has not been definitely excluded. The writer has reviewed the records of over 1000 cases presenting evidence of disturbed vesical innervation, seen at the Mayo Clinic between 1910 and 1925.

Rupture of the Bladder.—R. T. Vaughan and D. F. Rudnick² state that, as a history of injury in the hypogastric region, the finding of blood in the urine, and a persistently empty bladder, are the indications on which an exploratory laparotomy is most often performed for rupture of the bladder before the onset of peritonitis, if a history of injury is not forthcoming there is danger of this grave condition being overlooked or diagnosed too late. They describe a method which permits of positive diagnosis as soon as a complete rupture of the bladder has occurred, and which also enables them to distinguish between

intra- and extraperitoneal rupture, and report four cases. After passing a rubber catheter with all precautions, from 50 to 100 c.c. of air are introduced into the bladder by means of a hand-bulb, during which time the abdomen is being carefully observed with the fluorescent screen. In the case of intraperitoneal rupture, the air is seen to escape into the peritoneal cavity, whereas if the tear is extraperitoneal the air can be seen to spread along the fascial planes of the perivesical tissues outside the peritoneal cavity. In negative cases the air accumulates in and distends the bladder, giving it the regular vesical outline. [This method, together with that of injecting fluid into the bladder, involves the serious danger of distributing septic material throughout the peritoneal cavity or the fascial planes of the pelvis. Traumatic rupture of the bladder where a history of injury cannot be obtained must be of extreme rarity.—J. T.-W.]

Retention of Urine.—L. Cheinisse³ discusses the value of the intravenous injection of Hexamethylenetetramine (urotropine) as a preventive of post-operative retention of urine—a proceeding which has been much used of late in German clinics, especially those devoted to gynecology. It is important to remember that this drug may give rise to congestion of the kidneys and bladder, with consequent vesical pain, tenesmus, and hæmaturia; thus Goetz noted cystitis in 4 per cent; Wienzierl, tenesmus in 4 per cent and hæmaturia in 3 per cent. The cases of hæmaturia, however, occurred in cases in which several injections of a fairly large dose had been given. Schwab, who considers that urotropine should not be given intravenously in cases of post-operative retention of urine until more simple measures have been tried, such as the instillation of 20 c.c. of a 4 per cent solution of boric glycerin, found that 1.9 per cent of 420 cases developed hæmaturia after the intravenous injection of urotropine. The writer considers that it is only in obstinate cases that the treatment in question is called for, and then only in moderate doses, such as from 2 to 5 c.c. of a 40 per cent solution of urotropine, taking care not to repeat the injection if signs of vesical irritation appear.

Erich⁴ has devised a simple method for the gradual emptying of an over-distended bladder, which is of value especially in those cases of long-standing distention the result of prostatic obstruction. A catheter is placed in the urethra and secured. The catheter is connected to a rubber tube about 4 or 5 feet long to allow the patient free movement. By raising and lowering the distal end of this tube a level is found at which the intravesical pressure is only just able to expel the bladder contents. The end of the tube is then connected with a U-tube of glass, which is made to hang over the adjustable limb of an irrigator stand at the ascertained level. The distal end of the U-tube is now connected to the drip-bulb of a rectal-drip apparatus, which is introduced in order to prevent direct siphonage of the bladder contents. Finally, the drip-bulb is connected with a rubber tube leading to a bucket. The rate of flow from the bladder is regulated by varying the level at which the U-tube is suspended. The writer has obtained the best results by placing the U-tube at the height of the column of urine for the first twelve hours, and then lowering it 2 inches every day until the bladder becomes empty.

J. R. Caulk and J. H. Sanford⁵ describe their method of using the **Electric Cautery Punch** for the removal of 'vesical neck obstructions' under local anæsthesia produced by infiltration of the portion of tissue to be removed and its immediate surroundings, just before the commencement of the operation. The important points in their technique are, first, to obtain a firm grasp of that portion of the neck of the bladder which is to be removed, firmly retaining the tissue in the slot of the instrument until the procedure has been completed; second, to secure a dry field while the burning is being effected; and third,

to maintain firm pressure combined with rotation of the cautery blade during the process of burning, so as to cut through the tissue promptly within four seconds. An alternating current of 110 volts is the most suitable one to employ. The writers consider that the success of this operation depends on a proper selection of cases, achieved by correct interpretation of the findings obtained by cystoscopic examination of the neck of the bladder, together with observation of the changes seen in the region of the neck of the bladder, and felt on examination of the prostate per rectum, as the result of subsequent adequate catheter drainage of the bladder; for they state that a considerable proportion of the intravesical projection so commonly seen with the cystoscope is in many cases due to œdema and congestion secondary to spasm of the musculature of the bladder neck.

Trigonitis, also known by the terms 'cystitis colli', 'la cystite partielle', 'la cystite du trigone', and probably referred to in some of the cases described as 'la névralgie vésicale' and 'la neurasthénie urinaire', is discussed by Hammond⁶ as one of the causes of an irritable bladder. More common in women than men, it is most often met with between 40 and 55 years of age, the period of involution of the neighbouring sexual organs, but may follow labour and pelvic operations, especially if associated with retention of urine, and such conditions as salpingitis and appendicitis. It may persist after the objective signs of an infection of the urinary tract have disappeared, and occasionally occurs after acute infectious diseases, such as influenza. The writer states that, in 40 per cent of cases, no abnormality of the pelvic viscera can be detected and no evidence of a preceding urinary infection obtained. There is an insidious onset of frequency of micturition. Pain may be referred to the neck of the bladder, perineum, or external meatus, may radiate to the sacral and lumbar regions, and is generally most marked at the end of micturition. Examination of the urine may be completely negative, but on cystoscopy there will be seen congestion and thickening of the trigonal mucosa, which may have the appearance of red velvet. Œdematous patches, swollen papillæ, scattered red spots, or even small shallow ulcers may be seen. The congestion extends into the proximal portion of the urethra, and, in the male, the verumontanum may be congested and hypertrophied. In women the lesion is most marked over the trigone, in men in the posterior urethra. The author has found the condition to resist all those remedies that are beneficial in chronic cystitis; by the application of Surgical Diathermy through the cysto-urethroscope, however, he claims to have brought about immediate and apparently permanent relief of symptoms.

BACILLARY AND OTHER INFECTIONS.

Bacillus Coli Infection.—Thomson-Walker,⁷ in a paper on chronic urinary infection with the *B. coli*, after describing several of the clinical types more commonly met with in this disease, emphasizes the importance of accurate localization of the chief focus of infection and the discovery of the cause of the persistence or recurrence of the infection, for upon this success in treatment depends. Very careful and complete investigation of the urinary tract is necessary, as well as thorough physical examination, and tubercle should be excluded in all such cases.

Diuretics form an important part of the treatment of all cases, but more especially those of acute infection. A definite quantity of fluid in the twenty-four hours should always be prescribed, about 4 to 6 pints being an average amount. The effect of treatment with Alkalis is to neutralize the acid toxins produced by the *B. coli*, and has its most striking action in cases of acute infection. In chronic infection it has a much more soothing effect than

urinary antiseptics, and in many cases, where these have failed to destroy the infection, alkalis may be used while local treatment is in progress.

As regards urinary antiseptics, the writer uses **Salol** only as an alternative to those of the formaldehyde (hexamine) series when these are badly borne or have been administered over a long period, and he gives it especially when bowel symptoms are prominent. **Hexamine** is the best urinary antiseptic, and is best given alone in a draught of water between meals. Owing to the time required for the liberation of formaldehyde after hexamine has come in contact with an acid urine, the drug is of little value in kidney disease or in infections of the renal pelvis, in cases with polyuria and frequent micturition, and in those where the bladder is being continuously drained by catheter or where a fistula is present. After prostatectomy or bladder operations, hexamine is practically valueless until the bladder is closed. The acutely inflamed bladder is intolerant of a high degree of acidity of the urine; thus the use of acidifying drugs and urinary antiseptics in the presence of such a condition may only increase the severity of the symptoms without producing any effect on the disease. In chronic infections, hexamine is best alternated with other antiseptics, such as salol, or a course of antiseptic therapy may be given for from two to three weeks, followed by a course of alkaline treatment, a method especially useful when the bladder is irritable and intolerant of acidity and of formaldehyde. The value of hexamine as a prophylactic against hæmatogenous infection of the urinary tract before and after operation on the bowel and female pelvic organs, and also before and after parturition and operations on piles, when retention of urine may occur and catheterization be required, is insisted upon.

Hexyl-resorcinol, a urinary antiseptic recently introduced, has given good results, especially in cases of infection with the staphylococcus or streptococcus. For those cases of infection in which it is found impossible to render the urine acid, the writer has found **Methylene Blue** combined with **Sandalwood Oil** to be of use, especially in staphylococcal infections. As regards vaccine therapy, while individual cases of improvement or cure may be produced, there are no statistics available to show a definite percentage of success following such treatment.

Discussing "*the bladder after nephrectomy for renal tuberculosis*", at the 24th Congress of French Urologists, Thévenot³ states that in cases of unilateral renal tuberculosis vesical symptoms frequently completely disappear after nephrectomy. Sometimes symptoms persist, and suggest that vesical tuberculosis, once installed, can continue to develop on its own account. The pathological changes in the bladder may, after nephrectomy, (1) completely disappear; (2) disappear in so far as the specific changes due to the tubercle bacillus are concerned, leaving zones of congestion or yellowish plaques, etc.; (3) persist as active tuberculous lesions, which, however, in the majority of cases undergo considerable improvement as a result of the operation. The ureter usually becomes obliterated, but this is a slow process and takes several years; exceptionally, it continues to suppurate.

After nephrectomy, the symptoms become correspondingly modified, and according to the degree of improvement the cases fall into three groups: (1) Disappearance of all symptoms. (2) Temporary amelioration followed by aggravation as a result of the development of tuberculosis in the remaining kidney or in the genital tract. (3) Persistence of certain symptoms without the supervention of any such complications: (a) Frequency of micturition in the presence of clear urine shown by laboratory examination and guinea-pig inoculation to be free of infection; (b) Frequency, painful micturition, and pyuria, due to secondary infection and not to tuberculosis; (c) Similar symptoms with the persistence of tubercle bacilli in the urine.

The frequency with which the symptoms noted in Group 3 persist is not great, as shown by the statistics of the following writers: Wildbolz, 11.5 per cent; Borelius, 25 per cent; Israel, 54 per cent; Rafin, 9 per cent; Gayet, 24 per cent; and Rochet and Thévenot, 9 per cent. The mild bladder lesions heal rapidly; the more severe, somewhat slowly; whereas those that are extensive and deep heal with difficulty, and are associated with definite diminution of the capacity of the bladder. In all the cases pain disappears more quickly than frequency.

W. S. Pugh⁹ describes 2 cases of *bilharziasis* associated with a persistent urinary sinus. In one patient, complete retention of urine occurred shortly after the onset of hæmaturia, and external urethrotomy was performed. For two years a perineal fistula persisted. On the discovery of ova of the *Schistosoma hematobium* in the urine, intravenous injections of Tartar Emetic were given, and in ten days the urine was clear of ova and in three weeks the perineal fistula had completely closed. The second patient had a left renal fistula persisting for eight months, after an operation for perirenal abscess. On intravenous injection of tartar emetic, the ova had disappeared in two weeks, and in eighteen days the fistula had closed.

CALCULUS.

A. Hooton¹⁰ states that, from a study of the literature, he has been impressed by the fact that in America and Britain **Litholapaxy** is apparently ceasing to be regarded as the operation of choice for uncomplicated stone in the bladder, whereas in India, where for the most part only the bad cases are dealt with by the cutting operation, the opinion of an overwhelming majority of the surgeons is that litholapaxy, in proper hands, has great advantages over any of the cutting operations in all except the small percentage of complicated cases. The writer quotes five series of statistics involving, in all, 1600 cases of stone in the bladder, treated at various hospitals in India since 1920. Litholapaxy was employed in 1532 of these cases, with 10 deaths; perineal litholapaxy in 8, with 1 death; suprapubic lithotomy in 56, with 8 deaths; and perineal lithotomy in 4, with 1 death.

Joly and Andrews¹¹ find that of 371 consecutive cases of vesical calculus recently admitted to the wards of St. Peter's Hospital, London, litholapaxy was performed on 226, suprapubic lithotomy on 144, and perineal lithotomy on one. While, at first sight, these figures appear to confirm the impression that the operation of litholapaxy is declining in frequency, further investigation shows that this is not the case. In 79 of the 144 cases on which suprapubic lithotomy was performed, some form of prostatic obstruction was also present and necessitated an open operation. In 14, litholapaxy was contra-indicated by reason of some intravesical condition such as diverticulum. In one case an impassable stricture of the urethra was present. Of the remaining 50 of the 144 cases, in 8 the stone was too large to be crushed, 3 were vesico-urethral calculi, in 1 the stone was adherent to the bladder wall, in 1 the stone had formed round a drainage tube left in the bladder after a previous operation, and in 1 the stone was found on opening the bladder to deviate the urine prior to an operation for hypospadias. In 4 cases litholapaxy failed; and in 31 cases foul cystitis was present, and it is probable that the bladder was opened in order to relieve the infection. From these figures it will be seen that at St. Peter's Hospital litholapaxy is still considered the operation of choice for uncomplicated vesical stone. In one sense only has the operation declined. Before the introduction of prostatectomy, litholapaxy was considered to be the correct treatment of stone complicating prostatic obstruction. The results in these cases were unsatisfactory, as it was practically impossible

to evacuate fragments which had fallen into the post-prostatic pouch, and recurrence was the rule. No recurrence due to the imperfect evacuation of fragments has been noted in the present series of 226 litholapaxies, and the mortality was 2.2 per cent.

[These two articles show conclusively that in skilled hands the operation of litholapaxy is at the present time the operation of choice for stone in the bladder. When the surgeon is inexperienced in the treatment of stone he will choose the cutting operation, not as the better procedure, but as the one better suited to his attainments. The gravity of the operation, the duration of convalescence, and the late results are all in favour of litholapaxy.—J. T.-W.]

Johannes Meyer¹² reports two cases of vesical calculus in which he has been able successfully to exert a solvent action upon the stones by means of the establishment of **Continuous Irrigation** of the bladder with a weak solution of **Hydrochloric Acid** in water. The first case was that of a man, age 37, who had sustained a traumatic rupture of the urethra. Suprapubic cystotomy was performed immediately after the accident, and later an attempt was made to repair the urethra, without success. On admission to hospital some six months later the writer found him to have severe cystitis with purulent ammoniacal urine, a discharging urinary fistula at the site of the perineal incision, and three large stones in the bladder. As the writer considered these stones to be composed of phosphate or carbonate, he commenced continuous irrigation of the bladder with hydrochloric acid solution, starting with a strength of about 1-2000, which was increased to about 1-250. After nine days' uninterrupted irrigation, using 10 litres of solution every twenty-four hours, X-ray examination of the bladder and cystoscopy showed that all the stones had disappeared. Shortly afterwards, repair of the urethra with primary union was successfully achieved in association with a continuation of the continuous irrigation of the bladder. In the second case, a man of 82 years, similar evidence of successful solvent action was obtained. Meyer describes in detail the apparatus he employs for continuous bladder irrigation in cases both with and without a cystotomy wound.

DIVERTICULA.

It is stated by H. W. Martin and R. V. Day¹³ that a badly infected diverticulum of the bladder may give rise to symptoms as severe as those in advanced cases of vesical tuberculosis, carcinoma, or stone. They report six cases, and consider that the characters of the diverticular orifice as to position, size, and contractility are of great importance as an influence on the clinical course of a case. Diverticula opening on the upper part of the bladder, they find, have not infrequently thick muscular walls, and while the position of the orifice of such tends to favour drainage, yet, with the onset of inflammation with vesical irritability and intolerance of distention, the muscle at or around the diverticular orifice becomes swollen and contracted, shutting off communication with the bladder.

NEW GROWTHS.

After a careful survey of the literature, C. L. Deming¹⁴ finds only 64 cases of primary new growth of the bladder occurring within the first decade of life. He reports two cases of his own. In one, a boy 20 months old, cystoscopy revealed a smooth lobulated mass situated on the anterior and right lateral walls of the bladder, and at operation found to be a polypoid myxoma. Death occurred from recurrence eleven months after operation. His second patient, a boy 21 months old, was found to have a 'grape-like' mass attached to the trigone and filling the bladder. This was removed, and microscopic examination

showed it to be a rhabdomyoma. Recurrence in this case was even more rapid. Death from recurrence followed the operation in seven weeks. The rarity of bladder growths occurring in the first decade of life is shown by the fact that out of 3167 cases of bladder growth collected by various writers between 1900 and 1923, Deming found that only 47 patients were under 10.

The great majority of these growths are of mesothelial origin (sarcomata, myxomata, and myomata), and are usually polypoid in type. Of the 66 cases reported, 37 were sarcomata (24 in males, 13 in females), and their most common site of origin was the trigone. Myxomata were next in frequency (16 in 66). All, except one on the posterior wall, were situated on the trigone close to the internal urinary meatus. They appear as single, pedunculated, smooth, soft, lobulated tumours, which seldom ulcerate and are apt to recur with rapidity after removal. Microscopically they are covered with squamous epithelium, and resemble the gelatinous substance of the umbilical cord. These two varieties of growth are very malignant. They do not readily form metastases, but spread rapidly to the adjacent soft tissues, and death is usually due to uremia following on obstruction of the ureters. Of the 13 tumours of the series remaining, 5 were fibromata, 3 rhabdomyomata, 2 'polypi', 1 was a dermoid, 1 a papilloma, and 1 a myoma. The symptoms most commonly met with were: (1) Hæmaturia, which was spontaneous, periodic, and sometimes profuse. (2) Pain, variable in intensity, and often referred to the glans penis. (3) Disturbances of micturition, such as frequency, tenesmus, urgency, incontinence, and retention.

Deming urges the value of bimanual recto-abdominal examinations and cystoscopy in the diagnosis of these tumours, but is able to suggest little that is of help as regards treatment. The mortality is stated to be as high as 91 per cent whatever the treatment adopted; but the writer says the effects of the more modern methods of treatment by cauterization, by X-ray and radium applications, and by total cystectomy do not seem to have been reported as yet.

Between 1915 and 1924, 527 cases of bladder tumour were examined at the Mayo Clinic. In 75, the disease was so advanced, or the patient so ill, that no treatment was attempted, and these cases have been used by H. C. Bumpus, Jr.,¹⁵ as a basis for comparison in order to estimate the value of any apparent benefit following treatment. The average duration of life in 51 of the untreated cases traced from the time of onset of symptoms to death was 2·71 years, and from the time of examination to death 10·64 months.

Comparison of the results following the various methods of treatment leads Bumpus to draw the following conclusions. Tumours of a low degree of malignancy which are too extensive for fulguration or excision are best treated by **Cauterization**, but for tumours of a higher degree of malignancy the cautery is not suitable. The use of **Radium** alone is not successful in cases in which other methods of treatment are of no avail, but radium applications in combination with fulguration or operation are of value. Radium treatment followed by operation does not lead to good results. Re-examination at regular intervals of patients who have been under treatment for bladder growths is necessary in all cases, because of the high incidence of recurrence whatever mode of treatment has been employed. The degree of malignancy is the chief factor influencing prognosis, whatever the treatment.

A. J. Scholl¹⁶ finds that 31 patients with *tumour of the dome* of the bladder were treated surgically at the Mayo Clinic between 1910 and 1924. Tumours of the dome and posterior wall of the bladder are not common. Albarran found but one in a series of 67 cases; Fere, 2 in 107; and Delbru, 12 in a review of 1000 cases. The dome of the bladder resembles the 'silent area' of the stomach, the greater curvature, where tumours occasionally become

large before localizing symptoms appear. In some cases, the size of the tumour, and the presence of an area of fibrosis or calcareous degeneration, suggest that the condition has been one of long standing. The finding of a large fixed suprapubic mass producing no symptoms may be the first sign. Pain is uncommon, and frequency and hæmaturia, when they occur, are seldom as severe as in the case of tumours involving the more active segments of the bladder, the trigone and base. In 14 of the 31 cases under review, a transperitoneal resection was performed. The general peritoneal cavity was well packed off, and, unless there was marked contamination, the peritoneal cavity was closed without drainage. In none of these patients did peritonitis follow the operation. One died of myocarditis seven days after operation, one died three months after, and four from three to seven years after operation. Eight are still living, of whom 6 are well from one to three years after operation, and 2 have developed recurrences three years after operation. In 12 of the cases the peritoneal cavity was first opened to determine the extent of growth and to look for metastases. After incising the serous covering of the bladder around the area involved and separating the surrounding peritoneum from the bladder, the peritoneal cavity was closed by suturing the anterior edge of the resulting gap in the peritoneum to peritoneum on the base of the bladder. The peritoneal cavity having been closed, the bladder growth was completely resected. One patient died nine days after operation, no evidence of peritonitis being found post mortem; 2 died from recurrence, one two years and one four years after operation; 9 are still alive, of whom 7 have remained well from six months to seven years after operation, while 2 have had recurrences, one six months and one one year after operation. In the remaining 5 the tumour was in the dome of the bladder, and the peritoneum was not involved by growth. The peritoneum was stripped from the bladder wall and an extraperitoneal resection performed. One has not been heard from, one died from extensive recurrence a year after operation, and one from other causes. Two are alive; one of these had an extensive recurrence resected two years after operation, and two years later was known to be well; and the other was in good health two years after operation. All the cases in this series were malignant: 2 were malignant papillomata, one of which was multiple; 1 was a squamous-celled tumour; 23 were flat transitional epitheliomata; and 5 were adenocarcinomata.

A. Hyman¹⁷ describes his method of applying Radium through the cystoscope in the treatment of carcinoma of the bladder. This mode of treatment is limited in its application, but the writer considers that there are cases in which it is of value, viz., in combination with fulguration in the treatment of simple papillomata; in aged and debilitated patients; in patients refusing operation for carcinoma, or in whom operation is considered inadvisable for any reason; in the treatment of small pedunculated papillomata in which there is reason to believe that a malignant change has taken place; and for dealing with small recurrences following operative removal of carcinoma or fulguration of papillomata, except, of course, in the case of recurrences so situated as to be inaccessible to transurethral instrumentation.

H. W. E. Walther and C. L. Peacock¹⁸ state that they have found medical diathermy (thermopenetration), by means of which the temperature of the parts under treatment can be raised very appreciably, to be of distinct value in the treatment of epididymitis, endocervicitis, and arthritis. **Surgical Diathermy** (electrocoagulation), in which tumour-cells are destroyed by intense heat, should always be used for the treatment of simple papilloma of the bladder, and even in the case of malignant growths of the bladder it is very useful as a palliative measure for checking hæmorrhage and relieving pain in advanced

cases. The writers emphasize the importance of examining with the cystoscope, at regular intervals for some years, patients who have had bladder papillomata removed by surgical diathermy, in order that any recurrence may promptly be dealt with.

REFERENCES.—¹*Jour. of Urol.* 1925, xiii, 383; ²*Jour. Amer. Med. Assoc.* 1924, July 5, 9; ³*Presse méd.* 1924, Oct. 11, 809; ⁴*Jour. Amer. Med. Assoc.* 1924, Oct. 25, 1331; ⁵*Ibid.* Dec. 20, 1993; ⁶*Lancet*, 1924, ii, 1334; ⁷*Practitioner*, 1925, March, 181; ⁸*Presse méd.* 1924, Oct. 22, 838; ⁹*Boston Med. and Surg. Jour.* 1924, Nov. 6, 873; ¹⁰*Brit. Med. Jour.* 1925, i, 690; ¹¹*Ibid.* 901; ¹²*Presse méd.* 1925, Feb. 11, 187; ¹³*Jour. Amer. Med. Assoc.* 1925, Jan. 24, 268; ¹⁴*Surg. Gynecol. and Obst.* 1924, Oct., 432; ¹⁵*Jour. Amer. Med. Assoc.* 1924, Oct. 11, 1139; ¹⁶*Ibid.* 1147; ¹⁷*Surg. Gynecol. and Obst.* 1924, Dec., 827; ¹⁸*Jour. Amer. Med. Assoc.* 1924, Oct. 11, 1142.

BLOOD PLATELETS.

Ivor J. Davies, M.D.

S. C. Dyke,¹ of Wolverhampton, surveys the history of the blood platelets or thrombocytes and their place in medicine. He refers to the researches of H. Wright in America, and J. C. G. Ledingham in this country, who have demonstrated beyond a doubt the existence of the platelets as entities, the former promulgating what appears to be a true theory as to their origin from the bone-marrow. Dyke also describes the relationship of the platelet to the hemorrhagic diathesis, and to the production of purpura, and refers to the work of Duke, who has shown that clinically in the human subject, when the platelet-count descends below 60,000 per c.mm. (average normal count 300,000), there is an abnormal tendency to bleed, that below 10,000 hemorrhage becomes severe, and below 1000 fulminant.

G. J. Crawford² records his observations on blood platelets in anæmias and acute diseases, and concludes his paper as follows: (1) A considerable diminution in the platelet count was found in pernicious anæmia, lymphatic leukæmia, and purpura hemorrhagica, whereas an increase in these elements of the blood was noted in lymphadenoma and myelogenous leukæmia. (2) In those cases of secondary anæmia examined, normal or slightly increased counts were obtained. (3) Generally speaking, an increase of platelets would seem to be associated with a hyperactivity of the bone-marrow and vice versa, suggesting that the platelet originates in this portion of the hemopoietic system. (4) In one case examined, splenectomy resulted in very considerable increase in the platelet-count. (5) An increased bleeding time is associated with a low platelet-count. (6) No correlation could be made out between bleeding time and coagulation time.

D. G. Bannerman,³ for the Medical Research Council, has investigated blood-plate-counts in 65 cases of tuberculosis, and found that the blood plates are generally present in excessive numbers in active pulmonary tuberculosis, and broadly, the more serious the clinical condition, the greater is the degree of thrombocytosis. A fall in the count towards the normal coincides with improvement, whereas the persistence of a high plate-count has been associated with progression of the disease. The maintenance of a normal plate-count points to stability.

REFERENCES.—¹*Lancet*, 1924, ii, 714; ²*Ibid.* 595; ³*Ibid.* 593.

BLOOD-PRESSURE AND ITS ANOMALIES.

J. E. MacIlwaine, M.D.

(See also ARTERIOSCLEROSIS.)

S. B. Boyd Campbell, M.D.

The Clinical Use of the Sphygmomanometer.—K. D. Wilkinson¹ writes on the clinical use of the sphygmomanometer, noting that blood-pressure helps us clinically in differentiating the different types of arrhythmias, such as pulsus alternans. In pulsus paradoxus in pericardial effusion, there is a failure of pulse volume during inspiration, and in slight cases this may not be detected

unless by the auscultating method with the sphygmomanometer, when the sound will be found to vary markedly in intensity, being louder in expiration, and almost disappearing in inspiration. The diastolic pressure depends on three factors: (1) The rate of blood-flow through arteries and arterioles; (2) The volume of blood in the arterial system; (3) The action of the muscular and elastic coats of the arteries on the contained blood. He notes that this pressure cannot be estimated by the finger. In no individual does the pressure remain constant. He states that calcification of the arteries is of little importance as a source of fallacy. A constricted artery may be due to contractions of muscle, which may be overcome by massage. He uses blood-pressure as a means of diagnosing between cerebral hæmorrhage and thrombosis; likewise in enteric fever it may aid in the diagnosis between perforation and hæmorrhage, the fall of blood-pressure in the latter being very marked and prolonged. Observations in pneumonia may indicate some complications or impending heart failure. Its use in albuminuria is obvious. He does not think that a blood-pressure of 160 systolic or 90 diastolic is ever normal. Excitement may cause considerable rises of pressure, and a high pressure is of greater significance when accompanied by a slow pulse.

Blood-pressure Changes accompanying Coronary Occlusion.—L. T. Gager² considers that blood-pressure readings are an aid to the diagnosis of coronary thrombosis, particularly when angina pectoris is to be differentiated, as illustrated by the cases he cites. A sudden fall in arterial tension, following severe cardiac pain, rests on the physiological basis of infarction and myocardial insufficiency, following an occlusion.

The Clinical Significance of Recent Studies of the Capillaries.—E. P. Boas³ considers that the milder circulatory disturbances that so often persist for months after an acute infectious disease are very possibly correlated with a similar widespread disorder of capillary function. He was unable to confirm Kylin's observations. He quotes four necropsies of patients with high capillary pressures which revealed no trace of glomerular nephritis. In a number of cases of acute glomerular nephritis there was normal capillary pressure. A high capillary pressure will follow a dilatation of the arterioles or a constriction of the venules.

ARTERIAL HYPERTENSION.

(*Hyperpiesia. Raised Blood-pressure.*)

Inheritance and Hypertension.—J. P. O'Hare, W. G. Walker, and M. C. Vickers⁴ analysed the family history of 300 unselected cases of permanent hypertension, and compared them with series of controls, as follows:—

	Total patients	Average age	Family history of vascular disease	Early symptoms of vascular weakness in patient
Hypertension	300	51.5	Per cent 68.0	Per cent 42.0
Controls ..	436	36.2	37.6*	23.6†
Controls ..	121	45.1	37.5	—

* Vasomotor symptoms in 13 per cent.

† Family history of vascular disease in 13.6 per cent.

This shows that a family history of heart, kidney, or cerebral disease is almost twice as common in a patient with hypertension as in one without

increased pressure. The figures support the views of Alvarez and Cummings of the importance of early warnings of vasomotor weakness. Such symptoms may indicate a hypertensive diathesis, and in a susceptible person steps may be taken to protect against the excessive stresses and strains of life.

The Interpretation of Increased Blood Uric Acid in Hypertension.—Concerning the study of the etiology of the condition of hyperpiesia, A. M. Fishberg⁵ records the following work: The uric acid content of the blood in 110 cases of chronic hypertension, each having a diastolic pressure of 100 mm. of Hg or more, was estimated. Blood uric values of 3.5 mm. per 100 c.c. (determined by the method of Folin and Wu) were considered as presenting a hyperuricæmia. He found that none of these cases where there was a uricæmia but a normal blood urea showed a tendency to subsequent retention of urea and parallel development of uræmia. He likened the uricæmia to the hyperglycæmia common in hypertension, and gives the opinion that it is of no real prognostic significance. He states that the cause of death in these patients is myocardial insufficiency or, more commonly, cerebral hæmorrhage.

The Association of Hypertension with Suprarenal Tumours.—B. S. Oppenheimer and A. M. Fishberg⁶ remark that in a series of 30 cases of hypertension one of them found cortical adenomas in 5 instances, while in 50 necropsies in which no hypertension was present, adenomas of the suprarenal were found in only 1 case, and in this case the kidneys were granular. In 8 of 11 cases blood-sugar was definitely above the normal, in 2 of these being above the renal threshold, with resulting glycosuria. They found that neither experimental evidence nor chemical and pharmacological study of the blood lent much support to the attractive hypothesis of an excessive epinephrin content of the blood in hypertension. In certain rare instances neoplasm of the suprarenal may produce chronic arterial hypertension. Two cases are described. One was a man, age 24, with blood-pressure of 220 systolic and 160 diastolic, with great cardiac hypertrophy and no œdema of renal disease, but with an adenomatous tumour of the right suprarenal cortex. The second case was a girl, age 5, with sudden great increase in weight, sexual precocity, and heterosexual virilism. The blood-pressure was 190 systolic and 130 diastolic. No necropsy was obtained in this case.

Relationship between Certain Products of Metabolism and Arterial Hypertension.—R. H. Major⁷ details a series of experiments showing that products of metabolism—the guanidin bases—have a very powerful pressor effect, and all have a striking ability to raise the blood-pressure and to maintain it at a high level. In studying the excretion of guanidin in urine, a marked fall from normal is found in cases of hypertension, whether associated with nephritis or essential hypertension.

The Experimental Production of Hypertension.—F. R. Nuzum, M. Osborne, and W. D. Sansum,⁸ in experiments on three groups of rabbits placed on high protein diets, each group on a different type of protein, found that they developed an increased blood-pressure. Evidence of renal irritation was offered by the appearance and persistence of albumin and casts in the urine of these animals, and by a retention of non-protein nitrogen and urea nitrogen in the blood. There also was evidence of acidosis. It is suggested that diets containing an excessive acid or alkaline ash, necessitating the excretion of excessively acid or alkaline urines over long periods of time, might, in themselves, be responsible for degenerative blood-vessel and kidney changes.

Anatomical Findings in Essential Hypertension.—A. M. Fishberg⁹ states that the concept of essential hypertension includes those cases of chronic hypertension which neither clinically nor anatomically can be demonstrated to have evolved from antecedent inflammatory disease of one kidney or from urinary

obstruction. He finds: (1) In 72 cases of essential hypertension coming to necropsy, lesions of the terminal arterioles (arteriolosclerosis) were invariably present. (2) In every instance, the minute arterioles of the kidney (vasa afferentia and interlobulares) were affected. (3) The splenic arterioles were affected in about two-thirds of the cases, the pancreatic in about half, the hepatic in less than one-third, and the cerebral in about one-fifth. The lesions in these organs, when present, were not nearly so marked as in the kidney. (4) The terminal arterioles of the skin, skeletal muscles, myocardium, lungs, gastro-intestinal tract, and thyroid were very rarely involved, and then to only an insignificant extent. (5) The distribution of arteriolosclerosis is different from that of large-vessel atherosclerosis; the latter has its site of predilection in the heart, brain, and extremities, while arteriolosclerosis is most frequent in the kidney, spleen, and pancreas. (6) The view that hypertension is due to the statically increased resistance offered by organic lesions of the arterioles is untenable. A true generalized arteriolosclerosis does not exist in association with essential hypertension, and therefore cannot be the cause of the latter. (7) Changes in the arterioles of a nature similar to the arteriosclerosis of essential hypertension occur physiologically with advancing years. Arteriosclerosis is a pathological exaggeration of these physiological changes, resulting from the increased wear and tear incidental to the hypertension. (8) The anatomical changes in the kidney cannot be reconciled with the theory that essential hypertension is due to a disorder of renal function. (9) Only 5 of 72 cases of essential hypertension coming to necropsy had renal insufficiency. Increase in the non-protein nitrogen of the blood in essential hypertension may occur in three ways, anatomically characterized by: (a) Coalescence of the arteriosclerotic foci in the kidney; (b) Occurrence of more or less diffuse reaction—glomerular changes; (c) Evidence of cardiac insufficiency.

The Vascular Changes of the Kidney in Hypertension.—Based upon the microscopical findings in the kidneys in early hypertension, R. H. Jaffe¹⁰ suggests that the primary renal lesion should be sought in the tufts of the glomeruli. The fatal spasms occur in these. They result in a sudden interruption of the glomerular circulation and in an increase of the pressure in the afferent arterioles. The increased pressure distends the arteriolar wall. This is the first change remaining visible after death. Later the tufts, too, show signs of the harmful irritation. Their blood content becomes irregular. The capillary walls appear to be thickened and undergo hyaline degeneration (capillary sclerosis). The afferent arterioles are not only exposed to the rise of the pressure in their lumen, but irritating matter of endogenous or exogenous origin will also accumulate in that part of the arterial system and act most intensively upon its walls. As a result of this direct toxic injury to the arteries, we find in the latter stages proliferation of the intima, and hyaline and lipoid degeneration. The differences in the extent of the degenerative changes can be readily explained by the different quality and intensity of the injurious agent.

The Anatomy of the Splanchnic Vessels in Relation to Blood-pressure.—M. Brogitter¹¹ remarks that one thing is certain, viz., that between the height and duration of the blood-pressure on the one hand, and the mural changes of the mesenteric arteries on the other hand, there is no connection whatsoever. It has been proved also by investigation that the physiological manifestations of age act upon the mesenteric arteries at quite different periods of time, and are sometimes altogether absent, even in advanced age, and despite the enormously increased stress.

TREATMENT.—In discussing the treatment of so-called essential arterial hypertension, L. F. Barker¹² advises: (1) The fears of the hypersensitive patient must be allayed, and he must be inspired with confidence and hope.

(2) The use of Nitrites should be avoided except in complicating angina pectoris or in hypertensive crises, as patients usually feel worse after their administration. (3) Venesection or Lumbar Puncture may be used in emergencies. (4) Intramuscular injection of Sulphur, 0.1 c.c. of a 1 per cent suspension of sulphur in olive oil into the gluteal region at intervals of two to three days, increasing the doses to 2, 5, or even 10 c.c., until the spasm in the peripheral vessels is overcome and a marked fall in blood-pressure occurs. (5) Intravenous injections of hypertonic solutions of Glucose—10 c.c. of a 20 per cent solution intravenously. The pressure falls and anginal attacks disappear. (6) Course of Bromides for two to three weeks, repeating the course at intervals. (7) Calcium and Bromide therapy. (8) Digitalis in cases with the failing heart of arterial hypertension. (9) For insomnia, Allonal is recommended. (10) For headaches, Luminal.

L. F. Bishop¹³ notes the advisability of treating over-eating, worry, and neglect of exercise, and considers exercise very important, especially in fat people. He gives a full dose of Castor Oil once a month. At the beginning of treatment he gives a full dose on the 1st, 3rd, 5th, 12th, 26th, 47th, and 85th days; later, once a month. Digitalis is essential in cases with suffocative oedema. Eggs are contra-indicated in a great many cases, possibly due to an anaphylactic reaction. Cases with secondary low blood-pressure, i.e. a low blood-pressure following a previously high one, require special treatment to maintain pressure. Cerebral hæmorrhage is not more common in high blood-pressure than in others. Transient paralysis and aphasia are quite common, and may be due to spasm of the arteries or to slight hæmorrhage or blocking of a degenerative artery.

M. Bernstein¹⁴ draws the following conclusions on the use of a Salt-free Diet in treatment of arterial hypertension: (1) The deduction seems to justify the fact that the salt-restricted diet as a therapeutic measure seems to do most good in those patients with hypertension who are full-blooded, with perhaps a little oedema, some nocturnal polyuria, occasional dyspnoea, and with a plasma chloride content above 580 mgrm. per 100 c.c. (2) The treatment is valuable in the control of hypertension associated with the menopause; although it is well to note that all cases of menopause do not have hypertension. (3) In the case of hypertension with nephritis and salt retention, with oedema of varying degrees, it is often very valuable. (4) It is useful as an adjunct in some cases of cardiac decompensation with oedema. (5) A definite contra-indication exists in the later stages of nephritis, especially with a high urea content.

ARTERIAL HYPOTENSION.

A. Friedlander¹⁵ states that hypotension is a symptom, not a disease. The majority of writers place the limit of systolic pressure in hypotension at 110 mm. in adults. Alvarez,¹⁶ in a study of 1500 freshmen, found that pressures of young women are more uniform than men; 50 per cent of the women fell between 105 and 110 mm.; 50 per cent of the men fell between 116 and 136 mm. In Chinese, Bengali, and Filipinos the pressure average is 20 to 30 mm. less. Experience of life assurance actuaries goes to show that persons in middle life with hypotension have a better life expectancy than the average. Hypotension may be temporary or permanent. Acute hypotension is a part of anaphylactic or traumatic shock. While persistent low pressures often occur in association with certain chronic diseases, chronic infections, and sometimes cachectic states, in all of these some one or more of the three factors (force and frequency of heart-beat, peripheral resistance, and blood volume) must be involved. Histamine may be the cause in traumatic shock. Actual

myocardial weakness is not of as much importance in the production of hypotension as are disturbances of vasomotor tone and of blood volume. Friedlander concludes by advancing the hypothesis that many conditions of the blood-pressure may be due to poisoning of the capillaries by histamine or histamine-like substances, and that histamine and other vasodilators are being constantly produced in the body.

J. H. Barach,¹⁷ in a study of arterial hypotension, adopts the level of 110 mm. Hg as indicating the presence of this condition. He divides the result of his examination into groups. Group 1 included 656 students, amongst whom were found 30 cases of hypotension. Group 2 was made up of 1315 recruits referred for cardiovascular study, and 5.5 per cent of this group were rejected for hypotension. Group 3, composed of a similar type of men, gave 2.3 per cent. Group 4, 1100 male students, 2.5 per cent. In Group 5, 55 Marathon runners, 3 exhibited hypotension and apparently lacked stamina. His average was 3.5 per cent, while that of Alvarez, for 6000 students, was 2.2 per cent. His observations show that the hypotension patient has a marked inefficiency for physical effort, and that the condition occurs in patients of a small chest capacity. These patients cannot accommodate themselves to diminished oxygen supply. Having noted the lowering of pressure in typhoid, influenza, and other acute conditions, he mentions its occurrence in tuberculosis, the anæmias, diabetes, etc. He discusses as essential hypotension 100 cases comprising 40 males and 60 females. As a group he notices they are undersized, non-athletic, etc., and belong to the hyposthenic or asthenic type of individual. Their chest capacity is smaller than normal, and owing to their shallow breathing they suffer from diminished oxygen intake. Referring to arterial hypotension in middle life, he agrees that it is not against longevity. His summary is that hypotension is to be associated with a poor respiratory apparatus, and suggests that we might add, as one of the causative factors of arterial pressure, respiratory effort and oxygenation.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 1189; ²*Jour. Amer. Med. Assoc.* 1925, June 6, 1730; ³*Boston Med. and Surg. Jour.* 1925, June 4, 1085; ⁴*Jour. Amer. Med. Assoc.* 1924, July 5, 27; ⁵*Arch. of Internal Med.* 1924, Oct., 603; ⁶*Ibid.* Nov., 631; ⁷*Jour. Amer. Med. Assoc.* 1924, July, 81; ⁸*Arch. of Internal Med.* 1925, April, 492; ⁹*Ibid.* May, 650; ¹⁰*Amer. Jour. Med. Sci.* 1925, Jan., 88; ¹¹*Munch. med. Woch.* 1924, Aug. 1, 1049; ¹²*Med. Jour. and Record*, 1925, Feb. 18, 222; ¹³*Ibid.* 224; ¹⁴*Therap. Gazette*, 1925, April, 241; ¹⁵*Jour. Amer. Med. Assoc.* 1924, July 19, 167; ¹⁶*Arch. of Internal Med.* 1920, Oct., 381; ¹⁷*Ibid.* 1925, Feb., 151.

BLOOD REPLACEMENT.

Sir W. I. de C. Wheeler, F.R.C.S.I.

L. E. Davis and Harvey Cushing¹ endeavour to collect the blood lost during an operation, and replace it. The method hinges largely upon the routine employment of a suction apparatus. Laboratory experiments confirmed the writers of this paper in the belief that in many cases replacement of lost blood was well worth while.

The simple collecting apparatus consists of a sterile flask which is kept in a basin of warm water beneath the operating-table. It is fitted with a sterile two-holed rubber stopper (*Fig. 3*). From one hole passes a sterile glass tube attached to a length of rubber tubing which leads to a water faucet providing the suction. Into the other hole is inserted another glass tube with a sterile rubber-tube connection sufficiently long to be easily handled by an assistant. A sterile glass tube of any desired size or angulation fitted into the end of this section of tubing completes the apparatus. The flask is kept in a water-bath at about the temperature of the body. Clotting in the collecting-tube as well as in the flask is prevented by sucking up from time to time a few cubic centimetres of 2 per cent sodium citrate solution. It is evident that the combined

fluids obtained in this way will vary greatly in their percentage of red blood-corpuscles in accordance with the nature of the operation and of the lesion encountered. It will vary too with the skill and diligence of the assistant in his effort to obtain a 'rich' fluid.

If the patient's condition makes the replacement of blood desirable, the fluid is filtered through 40 or 50 thicknesses of sterile gauze into another sterile container. It is again filtered in a like manner into the transfusion graduate. The replacement may be made by the usual gravity method after the introduction of a needle into a vein at the elbow or ankle, or by direct exposure of the vessel and the introduction of a cannula. Upon several occasions, knowing that the tumour to be encountered was highly vascularized, and that in all likelihood there would be a considerable loss of blood on elevating the bone flap or after the enucleation, a cannula has been introduced into the vein before the intracranial operation was started. The lumen of the cannula was, of course, paraffinized and closed by an obturator until the time for its use.

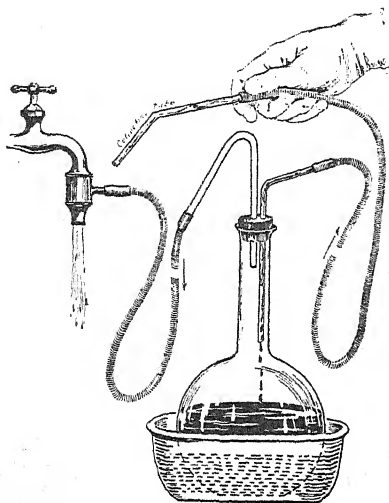


Fig. 3.—Davis and Cushing's method of blood replacement, showing the simple home-made arrangement of the suction apparatus. (Re-drawn from *Surgery, Gynecology, and Obstetrics*.)

During all intracranial operations at this clinic, frequent registrations are made of the systolic and diastolic blood-pressure, together with the pulse, the respiratory rate, and ether tension. These observations should be continuous, and should as closely

resemble the kymographic records of the laboratory as is possible. In all cases a red blood-cell and hæmoglobin determination has been made of the fluid to be reinfused, and also a similar determination of the blood still in circulation.

This apparatus has not only come to be used for convenience in 'sponging' in all intracranial operations, but during the past twelve months the collected fluid has been introduced into the patient's blood-stream on numerous occasions. Because of the great vascularity of the tissues which accompanies large meningiomas, many of these blood replacements were made during or after the removal of tumours of this particular kind.

In general surgery, especially in cases of ectopic gestation and removal of the spleen, the method described is most suggestive.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1925, March, 310.

BLOOD TRANSFUSION.

Ivor J. Davies, M.D.

Rufus E. Stetson,¹ of New York, records a report on the therapeutic value of blood transfusion, with his results in 68 cases of sepsis. He refers to the work of Novy and Dekrief,² who hold that the anaphylactic toxin results from the action of almost any alien substance, e.g., physiological salt solution, upon the blood plasma or serum, and who also showed that toxic substances develop in blood on standing for a period of three minutes. Drinker and Brittingham³ believe that the blood platelets apparently have more to do with reactions than

the serum, and that these occur after the blood has been kept out of its natural element for from three to five minutes even in the presence of sodium citrate. Stetson also refers to the views of Unger,⁴ who concluded that "sodium citrate, even in the low percentage employed in a citrate transfusion, affects the red blood-cells, rendering them more fragile, and the value of such blood to a patient suffering from a hæmolytic disease, such as pernicious anemia, is lessened to that extent". Bernheim,⁵ of Baltimore, who had charge of the transfusion work in the A.E.F., where nothing but citrated blood was used, gave a fair and unbiased discussion of this subject, and in conclusion stated: "There should be in every community at least one man who is competent to carry out the whole-blood method, and physicians should learn to differentiate their cases so that they may take advantage of this man's skill and give their charges that chance for life for which they come to him".

Stetson prefers the syringe-cannula method; his apparatus is simple, and consists merely of three to five 20-c.c. Record syringes and four basins of sterile normal salt solution. He suggests that every expectant mother should have her blood group determined so as to save valuable and perhaps vital time in case of need, and he quotes cases in illustration of this recommendation.

Pernicious Anæmia.—Stetson states: "It seems evident that no other therapeutic measure has the power and efficacy that transfusion of unmodified blood has in treating pernicious anæmia. It is indicated whenever the hæmoglobin reaches 35 or 40 per cent, and whenever distressing symptoms arise even when occurring at a much higher level. Amounts of 1000 c.c. or over of unmodified blood give the best results, for by using large amounts we obtain the maximum improvement both in the blood and in the general condition of the patient, and also give them a much longer interval between transfusions.

Sepsis.—Stetson refers to the excellent results of blood transfusion in children suffering from chronic empyema and in osteomyelitis. Convalescence is greatly shortened and the danger of intercurrent infections much lessened. Cases of severe malnutrition in infants were saved by transfusion. He concludes thus: "I feel that a great many patients could be saved if transfusion were started early and given every forty-eight hours until the blood cultures became sterile and the clinical improvement sufficiently marked to make it safe to stop; in most instances it is best to give only 500 to 600 c.c. of blood—less in children. I usually withdraw from the patient one-half to two-thirds of the amount to be given just before starting the transfusion. It is evident also from this report that the most dreaded complications are pneumonia and meningitis. Escaping these, and given a fighting chance, blood transfusion offers any patient with septicæmia at least a 50 per cent chance for recovery".

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1924, Oct., 534; ²*Jour. Amer. Med. Assoc.* 1917, lxviii, 1524; ³*Arch. Internal Med.* 1919, xxiii, 133; ⁴*Jour. Amer. Med. Assoc.* 1921, lxxvii, 2107; ⁵*Ibid.* 275.

BLOOD-VESSELS, SURGERY OF. (See VARICOSE ULCERS; VASCULAR SURGERY.)

BONE, RARE DISEASES OF. (See also OSTEOGENESIS IMPERFECTA.) E. W. Hey Groves, M.S., F.R.C.S.

'Marble Bone Disease'.—In 1904 Albers-Schönberg first described a case in which the long bones were harder and denser than normal, and liable to fracture after trivial violence. Since then less than a dozen cases have been recorded, and these are reviewed by Clairmont and Schinz,¹ who add a new example of this which has been called the 'marble bone disease'. The

probability is that the condition is really much commoner than is supposed, and that its nature is overlooked. The disease is of special interest in the comparison that it affords with such conditions as Paget's disease or osteomalacia. The long bones are normal in shape and size, and usually give no evidence of abnormality until a fracture occurs, when the X rays reveal a very dense shadow. The bone when exposed by operation is seen to be almost solid, i.e., the marrow cavity has been filled in by a concentric hypertrophy. The thickened cortex is also denser than normal, and cuts more like ivory than bone. Careful research has failed to find any general metabolic disturbance or endocrine deficiency. The broken bones heal normally, but callus production is slow and scanty.

Cartilaginous Tumours of Bone.—These tumours are very uncommon, apart from the cartilage-capped caricellous exostoses which arise at the epiphysial lines. But they are of importance because they are liable to become malignant, and it is well therefore to inquire by what evidence such malignancy may be manifest in any given case. Miss Keiller² has made a careful study of such cases, and records history and structure of a series, showing that every grade from innocence to intense malignancy may be exhibited. In the first place it is to be noted that a local rarefaction of a bone, whether central or peripheral, may be caused by a cartilaginous tumour, and it is important to investigate the nature of this at as early a stage as possible. The rate of growth is always slow in the early stages, and is of little help in determining malignancy. A capsule is usually well marked in periosteal growths, but quite absent from endosteal. Vascularity of the growth is very suspicious of malignancy. Myxomatous and mucoid degeneration are of doubtful significance. Sometimes these changes are associated with intense malignancy, but in other cases they occur in quite benign growths. Clearly all pure cartilaginous tumours of bone must be gravely suspect, and the histological finding will still leave us in doubt as to the prognosis and treatment.

REFERENCES.—¹*Arch. f. klin. Chir.* 1924, Nov. 28, 347; ²*Surg. Gynecol. and Obst.* 1925, April, 510.

BRAIN. (See also INTRACRANIAL SURGERY; SKULL.)

BRAIN, ABSCESS OF.

A. W. Adson, M.D., F.A.C.S.

Wells P. Eagleton,¹ of Newark, New Jersey, in analysing the records of 131 cases of *cerebellar abscess*, believes that 81 per cent of those resulting from otitic extension could be successfully dealt with surgically. However, his observations are based upon post-mortem records, and are, therefore, theoretical. In advocating operative measures, he follows Bourguet in doing a cerebellar decompression and then obliterating the lateral sinus on the affected side. [It is true that the lateral sinus may be obliterated and the abscess drained, but the reviewer believes Dowman's two-stage operation, permitting prolapse of the cerebellum through an occipital decompression, with attachment of the arachnoid to the margins of the decompression five days previous to drainage of the cerebellar abscess, more satisfactory, since the preliminary procedure has produced sufficient reaction to wall off the subarachnoid spaces and permit drainage from the abscess to the surface of the skin without contamination of the cerebrospinal fluid.—A.W.A.]

Joseph E. King,² of New York, in advocating a new method of dealing with brain abscesses, reviews the usual methods of drainage, and notes that herniation is usually mentioned as to be guarded against. However, he feels that the primary object is a problem of eradication of the abscess, and that herniation is to be desired rather than to be feared. After the abscess has been located

and the usual trephine opening made, a portion of the cortex overlying the abscess is removed and drains are inserted. The pressure from within gradually forces the drains out, and the floor of the abscess is everted. Herniation occurs, but gradually becomes less and less as the inflammatory process subsides, until there is no noticeable protuberance. The scalp, which during the process of drainage and subsequent herniation has remained open, can now be closed by a plastic operation, covering the defect in the skull and giving added protection. [This method is only practicable in those areas of the brain where the cortex has no known function, and the question arises of how much justification there is for removing a section of cortex when the superficial abscess, such as King has described, can be drained most easily by simple drainage.—A.W.A.]

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1924, Nov., 653; ²*Ibid.* 554.

BRAIN, TUMOURS OF.

A. W. Adson, M.D., F.A.C.S.

Ernest Sachs,¹ of St. Louis, in commenting upon the pathology of *gliomas* of the brain, classifies these lesions into three clinical types: (1) Gliomatous cysts; (2) The well-defined, fairly well circumscribed gliomas which can be quite readily enucleated; and (3) The infiltrating glioma whose border imperceptibly shades off into normal brain tissue. Pathologically, three groups are isolated, and the conclusions based upon these observations are that all gliomas that are cystic in character, or, if solid, have a sharp line of demarcation, are composed of glia nuclei, are favourable cases for radical removal, and, especially the cystic variety, offer a very good prognosis. Those that are deep-seated in the cerebellum are less favourable, but are so soft that, with suitable suction apparatus, they can probably be removed quite completely by that method; however, they show a great tendency to recur. Deep-seated tumours in the cerebrum are infiltrating growths, and are unfavourable to deal with.

E. B. Towne,² of San Francisco, comments upon six cases of brain tumour in which Röntgen-ray treatment was administered following operation. His conclusions are that there is no way of predicting whether the rays will have a favourable effect upon the tumour.

Howard C. Naffziger,³ of San Francisco, calls attention to the *calcification of the pineal body* in about 50 per cent of all skulls, and advocates the diagnostic significance of this positive X-ray finding in localizing brain tumours, brain abscesses, and brain swelling consequent upon a vascular block. The technique differs from the ordinary röntgenographic anteroposterior position in that the ray must be parallel to the line drawn between the external canthus of the eye and the external auditory meatus. A position of the pineal to the right of the mid-sagittal plane indicates a right-sided lesion above the tentorium, while a position to the left of the mid-sagittal plane indicates a right-sided lesion above the tentorium. A position of the pineal in the mid-sagittal plane in the presence of intracranial pressure indicates equal pressure on the two sides.

Percy Sargent,⁴ in an article on the present position of surgery of the nervous system, gives a summary of its status. The most important aid to neural surgery is the increasing ability on the part of the medical profession in the accurate localization of lesions. The author has selected and reported from his own experience four groups of cases which have so far yielded results which can scarcely be ignored even by the most conservative of physicians, namely, pituitary tumours, cerebellopontine tumours, meningeal endotheliomata, and spinal tumours. He dismisses the subject of pituitary secretion with the hope that it, like the thyroid secretion, may at some future date be somewhat understood, and considers the interest in the treatment of pituitary disorders to be solely in the relief of pressure symptoms caused by the enlargement

of the gland or by tumours in its vicinity. The chief of these symptoms are failure of vision and intolerable headache, for which relief can be obtained only by operative means, and, so far as our present knowledge goes, these are the only symptoms for which operation is justifiable. The tumours within the gland are nearly all simple adenomas that excavate the sella turcica and are recognizable by X-ray. The glandular symptoms are those of hypopituitarism. The fact that these patients are poor surgical risks must be taken into account.

The suprapituitary lesions are usually meningeal tumours in the interpeduncular space, and tumours or cysts of complex histological structure, probably arising in the infundibulum. These lie above the chiasma and compress it from above downwards. The author approaches these tumours by turning down a frontal osteoplastic flap hinged in the temporal fossa, and elevating the frontal lobe. He reports having obtained the best results with the adenomata, having operated on 20 cases, with only 7 deaths, a mortality of 35 per cent. Amongst his cases of suprapituitary tumours there were 5 endotheliomata and 6 infundibular tumours; 7 of the 11 patients survived the operation, and in 5 of them a substantial degree of improvement was obtained.

The majority of cerebellopontine-angle tumours are neurofibromata of the auditory nerve; others are cholesteatomata, of unknown origin. Symptoms are the most important diagnostic aid; deafness and tinnitus, perhaps for many years, are the earliest symptoms. The Bárány test is positive at an early stage. Very often the corneal reflex of the same side is diminished or absent; the coexistence of these signs would be sufficient reason for suggesting the presence of one of these tumours even in the absence of other symptoms. Later appear the classical symptoms of cerebral tumour: headache, vomiting, and papilloedema. Great risk accompanies the enucleation of these tumours: 88 per cent mortality in the author's experience, from respiratory failure. His mortality has been reduced to 16 per cent by incision of the capsule and removal of the tumour piecemeal—19 cases with 3 deaths. A series of 12 cases were treated by decompression alone, and although one of the patients lived for eighteen years in complete comfort and then died of an independent malady, still the results were not so good by far as in those cases in which the tumour was removed piecemeal. These last mentioned were mostly either early in his career or were far-advanced cases.

The meningeal tumours, or endotheliomata, are solid, encapsulated tumours, usually arising in the arachnoid tufts in the region of the longitudinal sinus. They grow slowly, and may be very large before giving symptoms of intracranial pressure. Complete removal was possible in 30 of a series of 41 cases of meningeal endothelioma; partial removal in 4. Nine, or approximately 22 per cent of this series, have recovered completely; 16, or approximately 38 per cent, have recovered, but have remained neurologically imperfect; 7, or approximately 17 per cent, died within 12 months; and 9, or approximately 21 per cent, died post-operative deaths.

Of 200 cases operated for tumours of the forebrain (frontal, temporal, parietal, and occipital), no fewer than 160 (80 per cent) were of an infiltrating or malignant character, the great majority being gliomata. Of 60 cerebellar tumours, almost all were gliomata or gliomatous cysts. The results of decompression and of partial removal compare very favourably with those of many merely palliative operations elsewhere, as, for example, colostomy for cancer of the colon. Gliomata appear to be peculiarly vulnerable to radium. The prognosis in operations for tumour of the brain is largely determined by the degree of intracranial pressure. Ventriculography is a valuable diagnostic aid, but its field is limited. Neurological examination will localize most tumours, and ventriculography is by no means free from danger.

Operation for spinal tumours provides some of the most gratifying of all the results of operation upon the central nervous system. Of a large number of cases operated for compression paraplegia, there were 72 instances of spinal tumour. Of this group, 35 were intrathecal and extramedullary—29 benign and 6 malignant; 16 were intramedullary; 10 were extrathecal—5 benign and 5 malignant; and 11 presented malignant disease of the bone. Thus, of the whole number, 29, or more than 40 per cent, were benign extramedullary growths capable of complete removal.

The author is very favourably impressed with the radiographic method of spinal diagnosis, originated by Sicard, of Paris, which consists of the arrest, at the point of blockage in the spinal canal, of lipiodol, a heavy inert oil containing iodine and remarkably opaque to the X rays (*see SPINE*). It is injected into the cisterna magna through a suboccipital puncture, with the patient sitting. From the shadow, the presence of a block may be determined; its extent may be found by lowering the head and injecting from below.

Surgery of the Pituitary Gland.—Charles H. Frazier⁵ comments upon the Bowman lecture given by de Schweinitz, in which a number of important anatomical observations were discussed, based upon the dissection of 125 specimens. These anatomical studies are of special interest, since they have revealed a number of inaccurate statements which at one time or another have appeared in text-books and essays on the subject. The relative positions of the optic chiasma and the overlying diaphragma and pituitary body were analysed. In 96 per cent of the 125 bodies examined, the optic chiasma was located either wholly or partly over the diaphragma sellæ and underlying the hypophysis, but only in 12 per cent of these instances was the entire chiasma found resting upon the diaphragma; in 79 per cent the greater part of the chiasma had the diaphragma-hypophyseal relation, while the lesser part projected behind the dorsum sellæ, and in 4 per cent the entire chiasma was behind the sella. These observations explain in part the very varied distortions of the fields we see in enlargements of the pituitary body. Emphasis is placed on the fact that a typical complete bitemporal hemianopsia is by no means a constant or even a most common field of distortion, and evidence points to the fact that the changes which take place during a typical bitemporal hemianopsia are not individual types, but constitute stages of an advancing process which usually but not always begin in the upper but outer quadrant of the field. Another interesting observation was the variation in the distance between the basal surface of the optic chiasma and the overlying diaphragma and pituitary body—in some instances a mere cleft, in some a clear vertical of 10 mm. Thus the pituitary body would have to double in size before pressure was made on the overlying chiasma or optic nerves. De Schweinitz' observations led him to doubt whether the principle of pressure or traction accounts for all the field distortions—for instance, the scotomata—and although he recognizes the uncertainties which exist, he endeavours to make out a case for toxic influences in this respect based upon the relationships of the subarachnoid space to the perivascular spaces of the pituitary structure. From the standpoint of therapy, Frazier emphasizes that the surgeon is primarily interested in the pressure phenomena, notably headache and impending blindness. Immediate recourse to operative interference is not justifiable in all instances. When vision is not threatened, glandular feeding and radiation should be considered; however, he feels that glandular therapy is questionable from a curative standpoint. Operative methods of approach vacillate between the transfrontal and the transphenoidal approach, depending upon the operator's familiarity with the technique. In the Neurosurgical Clinic of the University Hospital, in all primary intrasellar lesions the transphenoidal approach is

practised exclusively. Post-operative statistics reveal the fact that satisfactory restoration of vision has occurred in 70 per cent of the cases. This, with the fact that the operative mortality has been considerably lessened in the past few years, has increased the operability of patients suffering from this disorder.

G. Horrax and P. Bailey,⁶ of Boston, Mass., in a clinical and pathological report on twelve verified cases of *tumours of the pineal body*, found that the neurological localizing signs of pineal tumours consist largely in: (1) Involvement of the corpora quadrigemina, i.e., oculomotor palsies, partial or complete deafness; (2) Spasticity, usually bilateral; and (3) Evidences of implication of the cerebellum or cerebellar tracts. Of the five prepubertal cases, two showed considerable evidence of 'pubertas præcox'. The presence of 'pubertas præcox' in a patient who also shows manifestations of increased intracranial pressure and of involvement of the corpora quadrigemina is pathognomonic of pineal tumour, but there is no evidence that any secretion can come from the pineal cells to cause this syndrome.

L. Pussep,⁷ in an article on *tumours of the region of the sella turcica*, describes a new method of approach which he has devised and has employed, over a period of ten years, in 19 instances; 16 cases are reported in detail. All the patients showed the picture of Frölich's dystrophia adiposogenitalis, and some of them evidence of acromegaly. Nearly all the tumours extended beyond the sella turcica into the base of the cranium. The operation consists of a supra-orbital incision on one side, curved with its convexity upward; the frontal bone is turned down in a flap over the eye, the frontal sinus is removed, the roof of the orbit is broken away, the dura is opened by means of a flap, and the anterior horn of the lateral ventricles is punctured in order to collapse the brain. The frontal lobe is elevated, and the hypophyseal region exposed. Tumours or cysts can be removed radically, should this be possible, and the wound closed after drainage for twenty-four hours. In 3 of 8 cases of sarcoma a permanent cure was obtained; in 4, death followed the operation immediately, and in one it occurred eight months later. Of 3 cases of adenoma, all were cured. Excellent results were secured in 4 cases of cysts, which were removed radically and not drained. In the cases of acromegaly, the bony changes persisted, but the changes in the soft parts disappeared partially.

The approach, as devised by the author, is very similar to that used by Frazier, except that the bone-flap in this instance is turned down over the eye, while in the Frazier operation it is turned laterally. The objection to removing the roof of the orbit is that the weight of the frontal lobe, in many instances, will cause a prolapse of the eye and a disfiguring sequela.

REFERENCES.—¹*Ann. of Surg.* 1925, May, 893; ²*Jour. Amer. Med. Assoc.* 1925, June 13, 1813; ³*Surg. Gynecol. and Obst.* 1925, April, 481; ⁴*Bristol Med.-Chir. Jour.* 1925, xlii, 101; ⁵*Surg. Gynecol. and Obst.* 1925, June, 876; ⁶*Jour. Amer. Med. Assoc.* 1925, June 6, 1779; ⁷*Abstr. in Surg. Gynecol. and Obst.* 1924, Nov., 373.

BRAIN TUMOURS, ELECTRICAL RESISTANCE IN.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Not uncommonly in the course of exploratory operations for brain tumour it happens that the surgeon exposes an area of apparently normal cortex. If neither inspection nor palpation reveals any obvious abnormality, he is naturally hesitant about making a transcortical incision, for if he cuts into the brain and finds no tumour he may do irreparable damage.

In some of these cases the use of a bipolar electrode may reveal the pathological mass lying beneath an apparently normal cortex. Meyer and Schluter¹ have devised an apparatus whereby the resistance of living tissue to the passage of an electric current can be observed with sufficient accuracy for clinical use. Briefly the method is as follows: The familiar principle of a Wheatstone's

bridge is adapted so that a known resistance is introduced into one arm of the circuit. A fine bipolar needle is employed, containing two platinum wires carefully insulated one from the other, one running to the tip of the needle and the other to a point on the shaft about a centimetre from its tip, so that the current has to pass from one contact to the other to complete the circuit. This electrode is joined to another arm of the bridge. Next, an audio-oscillator (i.e., a tuning-fork vibrating to an electric current), together with a calibrated sliding contact for reading accurately the relationship between the known and the unknown resistance, are also placed in the circuit. As the needle containing the break in the circuit penetrates into the brain tissue, the current passes from the wire in the tip to return through the wire on the shaft, and the tissue in which the needle is placed sets up a resistance to the passage of the current. This unknown resistance in one arm of the bridge is compared with the known resistance in the other arm by estimating the intensity of the sound produced by the tuning-fork or audio-oscillator as heard in an ordinary radio ear-phone. The sliding contact is moved up and down its wire until the high-

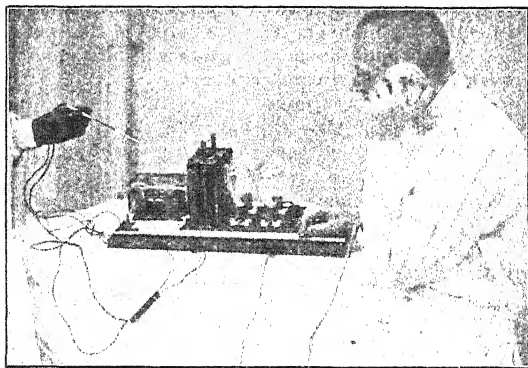


Fig. 4.—Meyer and Schluter's apparatus for testing electrical resistance in diagnosis of brain tumours. (By kind permission of the 'Zentralblatt für Chirurgie'.)

pitched hum from the tuning-fork disappears. Then the resistance is read off on the calibrations on the side. The apparatus is compact, and can easily be used in the operating theatre. (Fig. 4.) Grant,² of Philadelphia, has used it in nineteen cases, and found in every instance that tumour tissue produced a markedly different resistance from normal brain-tissue. Gliomatous tumours especially show a marked drop in their resistance when compared with the normal brain; and it is particularly with gliomata that the surgeon has difficulty in coming to a decision. Endotheliomata, owing to their difference in structure and greater density, usually yield a sense of resistance on palpation. Not so with gliomata, in which there is no difference of consistence to palpation on passing from normal to gliomatous tissue. It is in these cases, therefore, that the change in electrical resistance is of the greatest value. Given an apparently normal cortex, if exploration with the electric needle shows that there is a marked difference between the resistance in the cortex and that in the depth of the brain, it is certain that a lesion lies beneath that point, and a transcortical incision is justified.

REFERENCES.—*Zentralb. f. Chir.* 1921, 1824; *Med. Jour. and Record*, 1924, cxxi, Oct. 15.

BREAST, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The magnitude of the operation necessary for the effectual removal of cancer of the breast is in itself a reproach to surgery. We may be on the verge of successful treatment by immunization or radiology. There is a limit to the extent of operation, and it should not be attempted, as pointed out by Sampson Handley: (1) If the growth is fixed to the bony thorax; (2) In the presence of cancer 'en cuirasse', or in the presence of skin infiltration situated more than two or three inches from the primary growth; (3) If there is a fixed mass of adherent growth in the axilla; (4) If there is œdema of the arm; (5) If the supraclavicular glands are enlarged and fixed; (6) If there is visceral or bone metastasis; (7) If the growth is of the acute fulminating type; (8) In old age, if the growth is of the chronic variety. Special care should be taken to look for secondary deposits before recommending operation for cancer of the breast. Just as in cases of cancer of the stomach, an examination per rectum may reveal cancer particles which have travelled by gravitation to the pelvis after epigastric invasion. The mere presence of cancerous glands above the clavicle is not a contra-indication to operation. Halsted reported a series of this type of case which were well three years after operation. Most surgeons complete the dissection of the axilla before removal of the breast, for the well-known reasons: (1) That quite inoperable cases will be discovered in the early stages of the operation and the operation abandoned; (2) The lymphatics and blood-vessels are divided at the commencement of the operation furthestmost away from the cancer growth, thus lessening the subsequent hæmorrhage and preventing the dissemination of cancer-cells by early manipulation of the tumour; (3) The breast is left as a warm covering for the thorax until towards the end of the operation (Rodman).

Sampson Handley,¹ whose opinion must carry great weight in this field of surgery, believes that the removal of the infected circle of deep fascia can be best accomplished prior to the opening of the axilla. He bases his operative work on his well-known permeation theory. By permeation is understood the choking up of the lymphatic vessels by the growth in continuity of cancer-cells along them. Breast cancer may be conceived of as a gigantic ring-worm of permeated lymphatics situated in the plain of deep fascia.

Handley introduces radium tubes before closing the wound. Closure of the wound is not so difficult as might be anticipated. The wide removal of the deep fascia mobilizes and frees the skin to a surprisingly wide extent. A continuous suture of fine cotton or silk can usually be introduced without any tension. A many-tailed bandage applied loosely is preferable to a tight chest bandage, which is uncomfortable and even dangerous. The arm is placed in a separate sling. A three months' course of X-ray treatment is recommended after operation.

Raymond Johnson² deals with some clinical aspects of carcinoma of the breast. He points out, *inter alia*, that there is no such thing as a single mammary cyst, although a cyst often appears clinically as an isolated tumour without evidence of the small cysts which are no doubt present. A small tense cyst deep in the substance of the breast more closely simulates carcinoma than any other condition. In the event of bilateral carcinoma without evidence of metastasis, the two breasts should be considered on the same lines as if they belonged to different individuals. If each is apparently operable, both should be removed.

G. Woolsey³ points out that recurrence after a radical operation for carcinoma of the breast is the rule and not the exception. Judging the statistics of some German clinics, there was local recurrence in 58 per cent of the cases, 22 per cent occurring after the third year.

C. Linder¹ regrets that cancer statistics usually fail to list the *irradiated cancers* separately. The general average from nine German clinics cited is from 37 to 53 per cent surviving for three years. In his own experience 77 per cent of those given one or two intensive exposures have shown no signs of recurrence for three years to date. Only 17 per cent have survived of those not irradiated, and 43 per cent of those irradiated. None have survived of those given a course of mild irradiations. Medullary cancer seemed to respond most favourably to the post-operative exposures. This type formed 56 per cent of the three-year, and 50 per cent of the four-year survivals.

The Blue-dome Cyst.—E. I. Bartlett⁵ deals with the 'blue-dome' cyst, and writes as follows: "The term 'blue-dome cyst' was first employed to designate a benign cyst filled with straw-coloured fluid that showed a blue colour when cut down on. Subsequent investigations have shown that all cysts of the breast excepting the galactoceles are bluish, regardless of the fluid content, though there may be some variation in shade and intensity of colour, depending on the thickness of the wall or the degree of cloudiness of the fluid. The expression is still used in its original sense, and means a retention cyst resulting from blockage of the duct in association with involutional changes, or with an hypertrophy and abnormal secretion. A papilloma in a duct may lie quiescent or disappear, as is evident in a number of cases of bleeding from the nipple without subsequent development of carcinoma. Nevertheless there is a frequent association between papilloma and cancer. Bartlett concludes: (1) 'Blue-dome cysts' and papillomatous cysts cannot be differentiated clinically; (2) The fluid in a papillomatous or cancerous cyst may be straw-coloured; (3) All cysts should be explored.

Traumatic Fat Necrosis.—B. J. Lee and F. E. Adair⁶ write a long and interesting account of traumatic fat necrosis of the female breast, and its differentiation from carcinoma. They state: The clinical diagnosis of traumatic fat necrosis of the breast is often difficult, but in certain cases a correct diagnosis can be rendered before operation. The most important factors in the diagnosis of this condition are: (1) It always occurs in a fat breast; (2) It usually occurs in a corpulent subject; (3) A definite history of severe trauma can usually be obtained; (4) The tumour is painless; (5) In the vast majority of cases the consistency of the tumour is one of stony hardness; (6) Skin adherence is present in a large number of cases. The differentiation from carcinoma is at times difficult. In those patients in whom the lesion has existed for several years, carcinoma may readily be excluded. In more recent cases, extending over months or years, it may be impossible to distinguish the two conditions. Of the twenty cases, a diagnosis of non-malignancy was rendered before operation thirteen times. In seven instances a pre-operative diagnosis of carcinoma was made. The diagnosis of malignancy was therefore incorrectly rendered in 35 per cent of the cases.

A non-traumatizing excision of the tumour, together with a reasonably wide zone of surrounding tissue, will yield a satisfactory result. They have seen one instance of traumatic fat tissue appearing in a scar following an excision of a benign tumour. In cases of long standing, if the surgeon feels fairly certain that he has correctly diagnosed the condition, no excision or treatment of any sort need be strongly urged. Especially is such an attitude justified if the patient is a little worried because of the tumour in the breast. In general, however, they feel that the wisest course is excision.

REFERENCES.—¹*Modern Operative Surgery* (ed. by H. W. Carson), Cassell, London; ²*Brit. Jour. Surg.* 1925, xii, April, 630; ³*Ann. of Surg.* 1924, Dec., 932; ⁴*Deut. Zeits. f. Chir.* 1924, May, 289 (abstr. *Jour. Amer. Med. Assoc.* 1924, July 12, 159); ⁵*Jour. Amer. Med. Assoc.* 1924, Aug. 2, 343; ⁶*Ann. of Surg.* 1924, Nov., 670.

BRONCHIECTASIS. (*See also* CHEST, SURGERY OF.)*W. H. Wynn, M.D., F.R.C.P.*

TREATMENT.—M. Davidson,¹ from a study of cases in children, finds that the condition occurs at an early age more often than is supposed, and that in a certain proportion spontaneous natural cure occurs. He is impressed with : (1) The liability in children to the development of bronchial dilatation suddenly where bronchitis or bronchopneumonia has succeeded an attack of an acute specific fever, especially whooping-cough ; (2) The frequent persistence of slight catarrhal processes at the base of the lungs in children in whom, in addition to chronic bronchitis, there are untreated septic foci in the upper respiratory tract. That a certain proportion of children with early dilatation of smaller bronchi do recover with some degree of resulting pulmonary fibrosis, there can be no doubt, the rapidity and permanence of the cure depending upon early recognition, thorough measures to remove septic foci in the upper respiratory tract, and prolonged open-air treatment. It is in older persons that the typical bronchiectasis of the text-books is found, and here various mechanical methods are applicable : artificial pneumothorax, thoracoplasty, ligature of a branch of the pulmonary artery either as a measure in itself or as a preliminary to removal of a lobe. **Lobectomy** as advocated by Lilienthal is the most rational method, as it aims at complete extirpation of the disease, but the operation has a very high mortality. In 14 cases in which one lobe was removed, Lilienthal had a mortality of 42.8 per cent. In 10 in which more than one lobe was removed, the mortality was 70 per cent. The mortality of **Thoracoplasty** is about 12 per cent, but there is not the same justification for the operation as in tuberculosis. **Artificial Pneumothorax** is relatively disappointing as compared with the results in tuberculosis ; nevertheless considerable benefit has been obtained, and it should be an essential preliminary to more dangerous surgical measures. It may fail to obliterate old cavities with thick walls, but it is doubtful if thoracoplasty will do more. The operation of **Phrenicotomy** does not give any added benefit, as the effect of paralysing the diaphragm on the affected side seems to be to increase the movement at the base of the lung, owing to the movement of the abdominal contents. The emptying of cavities by **Postural Treatment** and the administration of drugs such as **Creosote**, **Terebinth**, **Guaiaecol**, **Garlic**, etc., will do much to diminish fœtor and even reduce the sputum for a time. The use of the creosote chamber is of all antiseptic methods the most effective. **Vaccine Treatment** is a valuable help, but long and painstaking investigation is required to make a suitable autogenous vaccine and arrive at the proper doses.

REFERENCE.—¹*Therap. Gazette*, 1925, April 15, 229.

BRONCHITIS, CHRONIC.*W. H. Wynn, M.D., F.R.C.P.*

R. A. Young,¹ discussing treatment, says that where possible the patient should be moved from places where cold, damp, and fog prevail, to those with an equable, dry, and sunny climate. Where patients cannot go abroad for the winter a change to a different suburb or district may benefit. Dusty occupations must be avoided. Since many patients suffer from arteriosclerosis, heart weakness, or asthma, a **Light Diet**, poor in nitrogenous constituents, is advisable, and the chief meal should be taken at midday. Flatulence may promote useless cough, embarrass the heart, and increase the paroxysmal character of the dyspnoea. Alcohol should only be taken in strict moderation. Smoking should be cut down or prohibited. The medicinal treatment varies with the type and degree of the condition.

1. The ordinary *winter cough* or chronic tracheobronchitis is the commonest variety. In such cases but little medicine may be necessary. A simple

expectorant mixture such as the following, to take occasionally, may be all that is necessary :—

R Vin. Ipecac.	℥x	Tinct. Camph. Co.	℥x
Syr. Scillæ	ʒj	Aq. Chlorof.	ad ʒj

Where cough is irritative and ineffective, a dose of the following in hot water may be helpful :—

R Sod. Bicarb.	gr. x	Spt. Chlorof.	℥v
Sod. Chlorid.	gr. iij	Aq. Anisi	ad ʒj

In cases with marked tracheitis, small doses of **Apomorphine** $\frac{1}{30}$ to $\frac{1}{20}$ gr., and of **Morphine** in the form of tinct. chloroformi et morphine 1885 B.P., 5 to 10 min., are often useful. Various **Demulcent Lozenges** such as the black currant, the glycerin, the ipecacuanha, or ipecacuanha and morphine lozenge, or one with a small dose of heroin, are all of value in certain cases.

2. In more severe cases with *asthmatic dyspnoea* or *copious mucopurulent sputum*, iodides, ammonium salts, and antispasmodic drugs, such as **Belladonna**, **Stramonium**, **Hyoscyamus**, or **Grindelia** may be useful. A valuable mixture in such cases is :—

R Pot. Iod.	gr. iij	Tinct. Stramonii	℥v-x
Pot. Bicarb.	gr. x	Syr. Tolu.	ʒj
Ammon. Carb.	gr. iij	Aq. Chlorof.	ad ʒj

3. **Bronchorrhœa**—the pituitous catarrh of older writers. In these cases the sputum may reach four or five pints in twenty-four hours. It is thin, watery, frothy, and non-albuminous. Treatment seems to exert little effect, but **Atropine**, **Belladonna**, **Acids**, and **Vaccines** may be tried.

4. **Dry catarrh** with little or no sputum but a chronic distressing cough. In this type **Saline Expectorants** with **Iodides** give the best results. Other drugs used in chronic bronchitis are **Ammoniacum**, **Terebene**, **Creosote**, **Garlic**, the **Balsams**, and the **Benzoates**. Some of these are worth trial in refractory cases. **Cod-liver Oil** with or without malt is often helpful, especially in thin, spare patients. Counter-irritation with **Acetic-Turpentine Liniment** is often helpful, and **Dry-cupping** of the bases may be used in acute attacks, especially in older patients. In cases with marked emphysema, special contrivances to promote ventilation of the lungs, e.g., **Kuhn's Mask** and the **Compressed-air Bath**, are helpful. **Vaccines** seem of less value in treatment than in prophylaxis. An autogenous vaccine should be preferred, and used in small doses.

The chief *complications* are attacks of acute bronchitis progressing to broncho-pneumonia, progressive emphysema, cardiac failure, and pulmonary tuberculosis. (1) Acute bronchitis should be treated on ordinary lines. The patient should be put to bed, however mild the attack, saline expectorants, diaphoretics, and stimulants being used as necessary, and the physical signs watched. (2) Advancing emphysema with increasing cyanosis demands a careful review of the patient's mode of life, occupation, and habits. The compressed-air bath may be of value. (3) Cardiac failure requires rest, relief of the engorged right heart by **Venesection**, **Leeching**, or **Purging**, and **Cardiac Tonics**. Venesection should not be used in old, enfeebled, or cachectic patients. (4) Pulmonary tuberculosis should be suspected in cases in which the summer intermission suddenly ceases. In all cases the sputum should be examined, as tuberculosis in the elderly often masquerades as senile bronchitis or is masked by emphysema.

Chevalier Jackson² describes two cases of *ulcerative bronchitis due to Vincent's organisms*. One patient, a woman of 18, had Vincent's angina with ulceration of the tonsils. Symptoms became more severe, with signs of extension to the bronchi. Bronchoscopy showed ulceration of the bronchial mucosa. Pus and shreds of whitish material came up on the sponges, and much thick secretion

was aspirated. The fusiform bacilli and spirochaetes were found to be abundant. Applications of Silver Nitrate 20 per cent were made six times weekly, and complete recovery followed. The second case, a man, age 22, had signs of a lung abscess. Bronchoscopy showed no foreign body, but the left bronchus was occluded by whitish material which came away as tube-shaped casts, leaving ulcerated surfaces. The predominant organisms found were Vincent's bacillus and spirochaetes. Cough and sputum ceased in a month without treatment. These are the first cases in which the bronchial lesions have been seen bronchoscopically. The chief difference between the appearance in this disease and in diphtheria and pseudomembranous bronchitis was the predominance of the ulcerative element. **Bronchoscopic Aspiration** of the secretions seemed to be a valuable addition to treatment.

REFERENCES.—¹*Lancet*, 1924, ii, 1141; ²*Jour. Amer. Med. Assoc.* 1924, Dec. 6, 1845.

BRONCHOPULMONARY SPIROCHÆTOSIS. (*See LUNG.*)

BURNS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. M. Willis¹ recommends **Débridement**, and early in the paper discusses the case of a boy with a third-degree burn extensively involving the median and anterior aspects of both thighs. Under ether anaesthesia the greater part of this area was cleanly excised with a scalpel, the dissection extending down to the apparently uninjured subcutaneous tissue. A dry dressing was applied. There was a striking relief from pain and a general improvement in the condition of the patient. Thiersch grafts and some subsequent plastic operations completed the cure. Five other remarkable cases are mentioned. A child, age 4, was burnt by her clothing becoming ignited. Nine days later the child developed bronchopneumonia and became critically ill. Saline solution was injected intraperitoneally, and under ethylene anaesthesia the burnt area was excised as rapidly as possible by three operators. Immediately afterwards transfusion was employed; the child was completely recovered three weeks after admission.

H. S. Souttar² points out that the first consideration is undoubtedly shock. If half of the surface of the body is involved, the injury will certainly be fatal; but a much smaller burn over the abdomen or thorax may have a similar result. A substantial injection of **Morphia** should be given at once. The teaching that morphia should not be given to children under these circumstances is entirely without foundation. Immersion in a **Warm Bath** brings great relief, especially in the case of children, and the water should be rendered slightly alkaline by a handful of washing soda. No attempt should be made to remove the clothing, which can be cut off in the bath later on. In smaller burns, when the skin is not broken, a piece of gauze soaked in a 10 per cent solution of **Washing Soda** gives considerable relief from pain.

Picric Acid has been very largely used and recommended as a dressing, but the danger of poisoning even with weak solutions is so considerable that he has given up its use. In itself it possesses only very weak powers as a disinfectant, and to some individuals is intensely toxic.

Paraffin Wax.—Souttar says that of all local dressings paraffin wax, when it can be applied, is by far the best. It must melt at about 50° C., and it may usefully be combined with mild antiseptics. Of the many compounds on the market, the original ambrine is as good as any. The following was widely used during the war as No. 7 paraffin: resorcin, 1 part; eucalyptus oil, 2 parts; olive oil, 5 parts; soft paraffin, 25 parts; hard paraffin, 67 parts. This should melt at 48° C., and will be found very satisfactory. It should be melted over a water-bath, and may be applied with a soft brush or with a

spray. The burnt area should first be cleaned and dried, best of all with a stream of warm air. It is then covered with a layer of the wax, over which a very thin film of cotton-wool is applied. This in turn is covered with wax, so that the whole is converted into a thin protective shell, which does not adhere to the raw areas. Any discharge can readily break its way through cracks in the wax envelope. The whole is surrounded by a bulky layer of wool. Simple though it is, the method requires a certain degree of skill, and unless a special appliance is used it is not very easy to apply the wax at just the right temperature. He recently devised the following method, which will be found to have several advantages. Strips of ribbon gauze, of narrow bandage, or of thin soft paper about an inch wide and 12 in. long, are prepared. Holding a strip by its two ends it is run through the melted wax. The strip is now held for an instant over the area to be covered, until the edges are seen to whiten, when it is at exactly the correct temperature, and is immediately applied around the limb or over the area. The strips are applied to the limb in series, exactly as if it were being strapped. They furnish complete protection and afford considerable support. By perforating the strips, or by leaving narrow gaps, room can be allowed for the escape of the discharge. The burning of the patient with hot wax is absolutely impossible. One great advantage of a wax dressing is the time for which it may be left undisturbed. In many cases it may be left in place for a week, and at the end of that time it can be changed with great facility, for it will not adhere either to skin or to granulations. If the wound is very dirty, the wax dressing may be changed every day with very little inconvenience to the patient, the exposed surface being cleansed with peroxide of hydrogen and dried before a fresh layer of wax is applied.

In certain areas great care is required to prevent subsequent deformity from contractures.

J. W. Tomb³ recommends *Linimentum Calcis Chlorinatæ*, or chlorinated Carron oil, as a most effective dressing for burns.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, Feb. 28, 655; ²*Lancet*, 1925, i, 142; ³*Brit. Med Jour.* 1924, i, 711.

CANCER. (See also under various organs, etc.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Surgical attention is focused at present on the possibility of recognizing *pre-cancerous conditions*; in other words, to determine more precisely the lesions which are likely to become cancerous and those which may be counted upon to remain innocent.

E. S. Judd¹ deals with these problems, and states that surgical treatment of cancer begins with the treatment of pre-cancerous conditions. He states that one of the most striking examples of a benign disease which later becomes malignant is that of leukoplakia, which occurs so frequently on the mucous membrane of the buccal cavity. He urges that all ulcers of the stomach should be removed as thoroughly as possible—"otherwise we should all continue to treat certain cases as simple ulcers when they are in fact malignant." The reviewer recently operated on a case of malignant disease of the stomach, situated where an ulcer had perforated twelve years previously. Many cases undoubtedly develop malignant disease if the incomplete treatment of ulcers is made a routine procedure. [As was demonstrated at the debate on this subject at the Bath meeting of the British Medical Association, however, opinion is coming round to the conclusion that the frequency with which ulcer of the stomach becomes malignant has been grossly over-estimated.—ED. MEDICAL ANNUAL.] Mention is made by Judd of the pre-cancerous

conditions in the breast, and it is pointed out that although chronic cystic mastitis does not always need surgical treatment, every solitary lump in the breast or any unusual nodule in association with diffuse mastitis should be excised immediately for microscopic study. Chronic ulcers of the skin, such as varicose ulcers, may become epitheliomatous; polypi, especially in the colon, and diverticulitis (common in the sigmoid) are other examples of pre-cancerous conditions.

Education of the Public.—If the goal of early diagnosis is to be reached, the education of the public in connection with cancer must be undertaken by the profession without delay. The mortality in cancer of the stomach alone is approximately 10,000 per annum in the British Isles. The radical treatment of early cancer of the stomach is as successful as the early treatment of cancer elsewhere, but without education it is impossible for the public to realize the significance and the possibilities connected with loss of weight, loss of appetite, and associated anæmia after middle life. Again, there is the case of cancer of the breast. The possibilities connected with the 'painless lump' are withheld from the great majority of the people. Responsibility rests upon the shoulders of the medical profession in connection with this question of public education.

A. E. Barclay² draws attention to the fallacy in believing that all *secondary manifestations* of necessity arise from the one primary growth. He refers, like other authorities, to the possibility of some outside cause that may stimulate similar cell elements in other parts of the body. Some of these so-called secondary growths may be entirely independent, originating from a common cause. The writer recently operated upon a case of cancer of the pelvic colon in which there was an independent carcinoma of the transverse colon near the hepatic flexure. There was apparently no connection of any kind between the two growths; neither could be called primary or secondary, but they probably originated from a common cause in a susceptible patient.

F. C. Wood³ discusses the *experimental pathology* of cancer. He deals with some practical questions such as the danger of incision into a tumour in order to obtain a portion for microscopic examination. The problem is attractive from an experimental point of view. Experiments are described, and the opinion is expressed, in a general way, that the danger of metastasis following incision into a tumour has been over-rated. If a surgeon can feel certain that, by cutting into a tumour of the tongue, breast, cervix, etc., for microscopic examination, he is not increasing the risk of dissemination, many unnecessary mutilating operations will be avoided. Wood also deals with what he calls *massage distribution*. If a correct diagnosis is not made, and the patient falls into the hands of quacks, massage of the carcinoma of the breast is rapidly followed in a short period by the distribution of the carcinoma-cells all over the body. The same results follow in animal experiments.

The Cause of Cancer.—Much original work has been done and important results have been obtained during the year 1925. It appears as if at long last the closely-guarded secret of the cause of cancer is on the verge of revelation. As the profession and the public watch the development of recent knowledge, it is interesting to note that the modern investigators have not been harassed and discouraged by detractors and biased criticism to the same extent as were their forefathers. There is an absence of the merciless and destructive criticism which accompanied other epoch-making discoveries.

Dr. Leonard Abrahamson (Dublin), in a personal communication to the reviewer, states:—

"The preliminary report by W. E. Gye, M.D., and J. E. Barnard, F.R.S., published in the *Lancet*, July 18, 1925, marks an epoch in the investigation

of the etiology of cancer. In a summary of the papers, the *Lancet* expresses the opinion that the work is a solution of the central problem of cancer. Whilst further research will be necessary before the results can be accepted in their entirety, there is no doubt that a new chapter is opened in the history of cancer research.

"The parasitic theory of cancer has been advanced by innumerable observers, but the work was so unconvincing that the weight of expert opinion was definitely against it. The first advance was made in 1911 by Peyton Rous, of the Rockefeller Institute. Rous described a sarcoma of the fowl which could be transplanted, not only by living cells, but also by means of dead cells and by a Berkefeld filtrate. By pursuing his investigations, he found that two other sarcomata of fowl showed similar properties. This suggested that cancer was due to a living virus, but against this view was the fact that tumours produced in this way retained their biological individuality.

"Gye started where Rous had left off. He found that by incubating a piece of chicken sarcoma in a suitable medium he could produce a culture which was capable of reproducing the tumour in other chickens. However, if the culture stood for some days, infectivity was lost. He suspected that this loss of infectivity did not depend on the death of a virus but upon the disappearance of an accessory chemical factor. To prove this, he made a sand filtrate of a tumour, capable of reproducing the tumour in doses of 0.05 cm. This filtrate was rendered innocuous by treatment with chloroform. By adding this innocuous filtrate to inactive culture, and inoculating an animal, tumour was produced. This suggested that two factors were necessary for the production of a tumour, one a virus, the other a chemical factor. . . . Further experiments on the Rous tumour and on tumours of mice, rats, dogs, and man added confirmation of this view, and suggested that whilst the virus is non-specific, the other factor is definitely specific, and varies from tumour to tumour and from tissue to tissue. This second factor is termed by Gye the specific factor. Thus cancer is produced by two factors: (1) A virus introduced from without and common to all tumours; (2) An intrinsic specific factor produced by the cells, probably as the result of chronic irritation.

"Having succeeded in culturing the virus and in producing multiplication in vitro, the next step was to try and render it visible. This was attained by Barnard, by means of special optical methods elaborated by him for the study of the filter-passing organisms of bovine pleuropneumonia. He succeeded not only in rendering the virus visible, but also actually in photographing it, and his observations correspond with those experimentally obtained by his colleague."

An immense amount of literature has appeared following the paper by Dr. Gye on the etiology of malignant new growths. It may be concluded, without reiterating the details of experimental work, that all malignant neoplasms contain an ultra-microscopic virus capable of cultivation. The virus in all probability has its habitat within the cancer-cells. Failure has attended every effort to reproduce the tumour through the activity of the virus alone; but if the virus is injected with extracts of tumours which are made virus-free, a malignant tumour is produced. Gye points out, therefore, that extracts contain an essential substance which he calls the specific factor, without which the virus is unable to transform the cells of the injected animal into cancer-cells.

Pregnancy and Carcinoma.—Raymond Johnson⁴ has had twenty cases in which the disease occurred in more or less close association with pregnancy and lactation. Under such circumstances the disease runs a particularly rapid course. One case of carcinoma of the breast is mentioned in this interesting

paper, associated with a considerable degree of fever. The age of the patient was 36. The temperature ranged from 100° to 103°, going as high as 104° on one occasion. On the twenty-fourth day (the thirty-second day of the fever) the breast was removed; the temperature at once fell, and subsequently ran a more or less normal course.

[Pyrexia in malignant disease in young people is not uncommon, and is associated as a rule with active cell division and breaking down of carcinomatous tissue.—*Brit. Med. Jour.* 1925, ii, 4.]

Carcinoma of the Lungs.—B. M. Fried⁵ discusses primary carcinoma of the lungs, and quotes authorities to show that the condition in reality is not as rare as was formerly believed. There are three elements in the lungs which may give rise to a primary carcinoma: (1) The epithelium lining the bronchial mucosa; (2) The mucous glands; (3) The epithelium lining the alveoli. Because of early metastasis, the chief symptom of the patient, as well as the attention of the clinician, is concerned with the secondary involvement, while the primary lesion is often overlooked. In any case of chronic lung affection with an atypical course and persistence of symptoms, especially if tuberculosis is excluded, malignancy should always be considered. The presence of pulmonary tuberculosis does not exclude the coexistence of malignancy in the same organ. Fried quotes McMahon and Carman and G. F. Thomas and H. L. Farmer as to the typical evidence of the X-ray, and concludes: Primary carcinoma of the lungs is apparently much more frequent than is commonly believed. Because of the similarity, from the clinical point of view, of primary lung cancer and a great many chronic lung affections, and particularly chronic pulmonary tuberculosis, primary malignancy of the lungs is often mistaken for phthisis or other lung disease. Primary carcinoma of the lungs possesses a vigorous metastatic power.

From the cases here reported, it seems that the tumour metastasizes very early, and the bones and brain are apparently much more frequently involved than is generally recognized. The bones may be infiltrated with tumour without producing any change in the outward structure.

D. Greenberg⁶ also refers to pulmonary neoplasm, and details three cases. After describing these, he states that a perusal of the clinical histories leads one to the belief that pulmonary neoplasm is not always manifested early by symptoms referable to the lung. In but one of the cases did the patient complain of cough early in the disease. In another case the pain due to metastasis evidently appeared much before one suspected the lung affection. These facts forcibly emphasize the importance of complete clinical and laboratory investigations, when symptoms and signs are not explicable on an obvious basis. To be sure, a diagnosis of pulmonary neoplasm may not be made on insufficient data, but suspect it one may, and in order to rule it out will require complete laboratory and clinical study.

The whole question of *metastasis* in cancer needs careful study in order to avoid pitfalls. The reviewer recently saw a case with an obvious tumour connected with the upper end of the femur, and on routine examination a definite tumour in connection with the upper lobe of the lung was found by X-ray. He was recently asked to see a patient at Mercer's Hospital in the medical ward who developed a sudden paraplegia and died within twelve hours. On X-ray examination (*Plate IV*), caries and collapse of the body of the third cervical vertebra was found. At the post-mortem, advanced cancer of the stomach was revealed. In the history of the patient there were no symptoms referable to the stomach. The sudden collapse of the third cervical vertebra was due to metastatic carcinoma.

Spinal Carcinoma.—T. Scholz⁷ published some time ago two cases of spinal

PLATE IV.

SECONDARY CANCER



Skiergram showing metastatic carcinoma of the 3rd cervical vertebra, secondary to symptomless carcinoma of the stomach.

carcinoma, one secondary to a primary lesion in the thyroid, the other following a primary focus in the breast. The primary tumours had remained latent and were obscure for a long period of time. Four more cases of spinal metastasis are presented, with similar diagnostic difficulties. The primary focus in each instance *was found to be within the thorax*. Scholz shows how important it is for radiologists not blindly to X-ray only the part of the body asked for by the clinician; he emphasizes very properly how spinal metastasis may give rise to very much more pronounced symptoms than the primary focus; thus, in cases of carcinoma of the right upper lobe of the lung with metastatic involvement of the lower portion of the spine, the pain in the back was diagnosed in various dispensaries as rheumatism, neuritis, sciatica, or some other condition.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, Jan. 3, 10; ²*Lancet*, 1925, i, 1286; ³*Jour. Amer. Med. Assoc.* 1925, Jan. 3, 4; ⁴*Brit. Jour. Surg.* 1925, xii, April, 646; ⁵*Arch. of Internal Med.* 1925, xxxv, Jan., 1; ⁶*Amer. Jour. Med. Sci.* 1925, May, 648; ⁷*Med. Jour. and Record*, 1924, July 16 (supp.), 20.

CANCEROUS AND PRE-CANCEROUS CONDITIONS OF THE SKIN. (See SKIN.)

CARBUNCLE.

E. Graham Little, M.P., M.D., F.R.C.P.

TREATMENT.—E. H. Griffiths¹ considers the treatment of carbuncles under two heads: general and local. He deprecates vaccine treatment in the initial phases of this disease. Where the patient's resistance is much lowered, blood transfusion is useful as a preliminary to other treatment. Free action of the bowels is secured by saline purges, small doses of calomel, and copious ingestion of fluid. Local treatment may be operative or non-operative. **Operative Treatment**, if decided upon, should be done immediately, under a general anæsthetic. The whole mass may be excised, which is a method of choice, and the wound dressed with gauze, soaked in a concentrated solution of magnesium sulphate, covered with jaconet, and the dressing renewed after twenty-four hours. Bipp may be used instead of magnesium sulphate dressing. Another method recommended is to soak the cavity, after operation, with pure carbolic acid. The cavity is then sponged dry, and packed with gauze. All first dressings should be performed under gas anæsthesia. The gauze dressing should be soaked away, and the wound cleansed with saline, eusol, or hydrogen peroxide (4 vols.). The injured part should be kept at rest by splints or sand-bags. Operation should be immediate in cases of carbuncles situated upon the nose or on the surrounding part of the face, as these frequently prove fatal, unless dealt with at once.

REFERENCE.—¹*Lancet*, 1925, i, 37.

CAROTID TUMOURS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Tumours of the carotid body have been previously alluded to (*see MEDICAL ANNUAL*, 1923, p. 116, and 1925, p. 296). Pathologically, these tumours are of an innocent endothelial type. The available evidence tends to show that in the early stages they retain this innocent structure, but later become definitely malignant. If the tumour is dissected off the carotid vessels it recurs locally as a rule, and in radical removal it becomes necessary to ligature all three carotid vessels and remove the involved portion of the vessels with the tumour.

II. A. Royster¹ mentions a case in which a radical operation was performed and there had been no recurrence at three years.

Pre-operative diagnosis of tumour of the carotid body is rare. Royster quotes the following summary of the signs, given recently by Klose, which

emphasizes the points essential for the diagnosis: (1) Location at the bifurcation of the common carotid. (2) Good lateral mobility with limited vertical mobility. (3) Ovoid form, a superficially uneven surface, and a firm elastic consistency. (4) Expansile pulsation and a systolic bruit, both of which disappear after compression of the common carotid. (5) Anterior arching of the wall of the pharynx and paralysis of the vocal cord. (6) Occasional narrowing of the pupil on the diseased side. (7) Slow growth and protracted duration. (8) Absence of pain on palpation. According to Cohn, the conditions to be differentiated from carotid tumours are lymphosarcoma, metastatic carcinoma of the lymphatic glands, aneurysm, gumma, tuberculous cervical glands, and aberrant thyroid.

In the treatment, early and complete removal, even at the expense of the large vessels, seems advisable. The operation may be done in two stages, according to Halsted's plan, by first ligating the common carotid artery, and then waiting for several days before extirpating the growth. To date, no case treated successfully by medication or radiation has been recorded.

REFERENCE.—¹*Southern Med. Jour.* 1924, xvii, 196 (abstr. *Surg. Gynecol. and Obst.* 1924, July, 8).

CATARACT.

Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)

The Treatment of an Incipient Cataract in America.—G. F. Harkness¹ reports the results of treating 14 cases of incipient cataract by injection of **Lactigen** (Abbott); 50 per cent were said to be improved as regards ability to read letters. The author, after an admirable survey of the whole subject, regards his own results as inconclusive. The great interest of his paper for the practitioner is that he has collected the opinions of *forty professors of ophthalmology* of the *Class A Medical Schools of America*, as to the value of treatment in incipient cataract. Summing up their experience, he finds that 20 find no benefit from any form of treatment; 12 report positive benefit from various forms of treatment, local or general; 2 showed doubtful results, and 9 possible benefit having been obtained. [Some reported under two headings.—A. E. J. L.] **Dionin** locally, with a view to stimulating the circulation in the anterior portion of the eye and improving nutrition; **Iodine** therapy, locally and internally; together with **Dietetic Supervision** and the improvement of general metabolism, practically include the chief forms of treatment carried out by the majority of American ophthalmologists.

[A practitioner is certain to be asked, some time or other, for advice on this matter. In the first place, it seems to the reviewer he should consider the type of patient. It is certain that to tell a highly-strung patient he has cataract, a disease most patients know of and dread, is to cause mental anxiety, which may be more potent for ill than any remedy he may use for good. To remove any toxic source, to regulate diet, and to correct errors of refraction, can do nothing but good, and all of these are said by various authorities to be of service. None of these direct any attention to the eye. One of the best authorities in America prefers to use **Sodium Iodide** locally. To order this drug in the form of drops, with some simple explanation of their value, such as preserving the sight, is an easy matter. Should any line of treatment seem called for, this seems to the reviewer a simple, cheap, and unobjectionable one. It would appear, however, that senile cataract is a degenerative condition. It progresses at very variable rates of speed. Slit-lamp microscopy reveals the fact that certain changes take place in the lens fibres leading to the formation of what are called 'water clefts'. In certain situations these cause deterioration of vision. The fluid later may become absorbed and vision improve. Should this, or other changes affecting the

transparency of the lens, happen to follow the giving of a certain remedy, its effect as regards improving the vision is attributed to that particular remedy. This possibly accounts for the genuine belief of perfectly honest people in very different forms of treatment. The reviewer's own experience leaves him still with an open mind on the subject.—A. R. J. L.]

Indications for Cataract Removal.—E. Jackson,² in the course of an excellent survey of these, calls attention to a point often overlooked, viz., that poor vision *with* lens opacity may not mean poor vision *due* to lens opacity. It is astonishing how much opacity there may be with even standard vision. When an opacity is present, the loss of vision may be due to another cause, e.g., old scars in the cornea may become more hazy with age, vitreous opacities may develop, etc. It must be remembered that changes of refraction always occur in cataract, and some of the loss of vision may be due to these. Correction of these may suffice to make the patient comfortable for a time at least. The *positive* indication for removal of a cataract is when the patient's vision has fallen to the point at which accustomed acts and occupation are interfered with. As regards monocular cataract, the value of removal in extension of the binocular field of vision is rightly pointed out, although binocular vision will not be obtained. The danger of a lens becoming hypermature must be considered, though Jackson says senile cataracts rarely become hypermature. [In cataract, though astigmatism is common, the change of refraction is towards myopia. Practitioners, not experts in refraction, who have old and infirm patients under their charge, and who cannot consult a specialist, may occasionally help them a great deal by testing them with a *weaker* reading-glass than they are using. There may be a difference of two dioptries, as in a case seen recently. This alteration makes a very great difference. Senile cataract in Northern India often becomes hypermature, and, if no special indications forbid it, is usually best removed when mature.—A. E. J. L.]

Some Aspects of Primary Cataract.—H. Kirkpatrick³ says that the age of the average senile cataract patient in S. India is at least ten years younger than that of the patient in Europe. He notes that glaucoma due to a swelling cataract is seen about 50 times every year in the Madras Eye Hospital, or in 0.25 per cent of cases. He thinks that the evidence supports the fact that glare, especially tropical glare, has a deleterious effect on the health of the lens fibres. He points out, however, that cataract is not equally common in other tropical countries, in which equal glare is experienced. The routine operation in Madras is capsulotomy *before the incision*, by means of a cataract needle inserted at the point at which the surgeon is going to insert his knife. Atropine is instilled before this proceeding. Irrigation is always employed. Smith's method of lid control is employed if the patient is restless. [Smith does not use a speculum, but an assistant lifts the upper lid on a strabismus hook and at the same time controls the orbicularis muscle. An invaluable proceeding in troublesome patients.—A. E. J. L.]

Many useful practical details of technique are given. Kirkpatrick says: "One wishes to avoid frightening the patient by giving him instructions which he may find difficult to carry out, and should therefore be prepared to effect delivery of the lens regardless of the direction in which the eye is turned at the time". [Practitioners in the East, who constantly have cataract cases under their care, should always warn the patient to seek advice at once, if pain or redness of the eye develops. Scores of eyes are seen in a large clinic in N. India every year in which glaucoma has supervened and the eye has been lost because the patient thought the symptoms were due to the ripening of the cataract, or did not appreciate the importance of immediate attention. The reviewer is also of the opinion that glare is a factor in the production of

cataract, and would advise practitioners to tell patients going to the East of the necessity of protecting their eyes against glare by wearing suitable glasses in bright sunlight.—A. E. J. L.]

Intracapsular Extraction of Senile Cataract.—A. H. H. Sinclair¹ has operated on 52 cases of senile cataract, employing a forceps of his own designing, which is a modification of Kalt's pattern. They are large-bladed and toothless, slightly curved, and provided with a hollow into which the capsule tissue is bunched, thus rendering the grip more efficient. A large incision is made, and an iridectomy is performed, followed by insertion of the forceps, which is first opened and then closed with slight pressure against the lens. In this way a fold of capsule can be firmly grasped. Gentle forward traction is first employed; then, after a pause, traction is made in different directions upwards; this causes the fibres of the suspensory ligament below to give way one at a time: this step takes about thirty seconds. After this, the lens becomes pear-shaped and can be delivered with comparative ease, complete in its capsule. Sixteen cases obtained $\frac{6}{6}$ vision, 18 $\frac{9}{6}$, the remainder lower degrees. Vitreous loss occurred 7 times, but good or fair vision resulted apparently in most cases. Sinclair concludes that this method is the least traumatic of the intracapsular methods, and the apparatus is of the simplest.

[With a very large experience of cataract operations by the intracapsular and all the usual methods, and exceptional opportunities of observing the work of others, the reviewer has no hesitation in saying that intracapsular retraction is the ideal method. Space does not admit of a discussion of this operation, which attracted a good deal of attention at the International Congress in June last. It has yielded good results in Sinclair's hands, and has the merit of simplicity. In the reviewer's opinion, neither it nor any other intracapsular operation should be attempted by any but an experienced and skilful operator, and great care should be taken to choose, for the early cases, perfectly placid patients, or steps taken to render them so. Patients with sunken eyes are usually to be preferred, and those with bulging eyes to be avoided, by beginners in this operation. In an operation technically perfectly done, experience shows that practically the only complication to be feared in an intracapsular operation is suppurative. The same cannot be said of the other methods.—A. E. J. L.]

Intracapsular Extraction of Cataract by Barraquer's Method.—I. Barraquer⁵ read a paper, advocating extraction by means of his special instrument, for a full description of which see MEDICAL ANNUAL, 1922, p. 76. Several speakers discussed the operation, but no one had a favourable opinion of it.

A Plea for Revising the Operation of Couching.—G. L. Johnson⁶ has had three cases, one after another, in which rupture of the choroidal vessels occurred, with severe bleeding, after a cataract operation in patients suffering from advanced arteriosclerosis. He suggests that the operation of couching should be considered in these cases. [No one who has seen the results of lens-couching in India can be very enamoured of it. The author says that the patient will have a certain amount of useful sight for one or two years. This is by no means certain, as, apart from the eventual loss of sight, glaucoma frequently results after the operation, as well as other complications.—A. E. J. L.]

Advantages of a Strong Solution of Atropine in the Removal of Cataract.—G. F. Alexander⁷ says that as atropine of the usual strength, instilled prior to the operation, frequently fails to give the pupil its maximal dilatation, invariably fails to prevent it contracting on the escape of the aqueous, and generally loses its effect on the iris soon after the operation, he was led, after experimenting, to use one drop of a 5 per cent solution, one hour before operation. He claims among other advantages: (1) That a limbal section is greatly

facilitated, and that the iris is less likely to be wounded by the point of the knife when crossing the anterior chamber; (2) Cystotomy or Barraquer's operation is made easier; (3) Extraction of the whole lens, or its nucleus, is made easier, cortex is more easily removed, and iris prolapse is less frequent; (4) Risk of bleeding from the iris is diminished.

Two Hundred Cataract Operations with a Lower Corneal Section and Iridectomy.—Roure⁸ claims that his statistics show that complications are not more frequent by this than by other methods. It is technically easier, and if complications occur during extraction they are more easily dealt with. Dazzling was remarkably seldom complained of. Infection did not occur more frequently. [It is interesting to see this old method advocated in these days. The reviewer has seen many results of a lower section performed by other operators in India. In a tropical country a lower iridectomy is a thing to be avoided.—A. E. J. L.]

Hypersensitivity to Lens Protein.—Verhoeff and Lemoine have recently shown that 8 per cent of individuals are hypersensitive to lens protein. In such people, rupture of the lens capsule, whether due to trauma or operation, leads to an intra-ocular inflammation called 'phaco-anaphylactic endophthalmitis'. A. E. Lemoine and A. E. Macdonald⁹ have confirmed these findings. They say it is necessary to carry out this test (1) in unripe cataracts, (2) in traumatic cataracts, (3) in cases in which operation on one eye has been followed by bad vision or prolonged pain with redness of the eye. In these cases it is necessary to desensitize the patient.

The Use of Radium in Cataract.—Some authors have reported improvement in vision after the use of radium in cataract. Thus Franklin and Cordes reported improvement of the vision in 84.5 per cent of cases. A. B. McKee and W. F. Sweet,¹⁰ however, after a careful study of 25 cases, arrive at the conclusion that it is of very little value.

REFERENCES.—¹Amer. Jour. Ophthalmol. 1925, Feb., 132; ²Ibid. April, 322; ³Trans. Amer. Acad. of Ophthalmol. and Oto-laryngol. 1924; ⁴Brit. Med. Jour. 1924, ii, 661; ⁵Ibid. 1925, ii, 660; ⁶S. Afric. Med. Record, 1925, May, 209; ⁷Trans. Ophthalmol. Soc. U. K. 1924, 78; ⁸Ann. d'Oculist. 1924, 888; ⁹Arch. of Ophthalmol. 1924, March, 101; ¹⁰Amer. Jour. Ophthalmol. 1924, Aug., 589.

CENTRAL NERVOUS SYSTEM, EPIDEMIC DISEASES OF.

Joseph Priestley, B.A., M.D., D.P.H.

The Milroy Lectures for 1925 (A. S. MacNalty—*Lancet*, 1925, i, 475, 532, 594) dealt with the above subject, and brought under review such interesting diseases as cerebrospinal fever, poliomyelitis or polio-encephalitis acuta, and encephalitis lethargica. These are now established as infectious diseases, which take on, at times, epidemic proportions. They require, therefore, to be dealt with by preventive measures similar to those in use for other epidemic diseases. Mild and abortive forms are the trouble, rendering exact diagnosis so difficult. The diseases are compulsorily notifiable, and, consequently, their epidemic and infectious natures are officially acknowledged. Direct contagion from case to case is exceptional, but healthy carriers of the meningococcus and of the various types of virulent and avirulent meningococci have been proved to exist, the toxin of the meningococcus not, apparently, gaining entrance to the meninges through the filter of the nasal and oral passages, coupled with which are the powers of resistance of the persons attacked. Carrier epidemics precede and are associated with the case epidemics.

Cerebrospinal fever often kills in the acute stage, poliomyelitis or polio-encephalitis and encephalitis lethargica in the 'after-effects' stages. There is an increasing susceptibility on the part of nervous tissue in certain individuals to attacks of epidemic disease. What is the cause? The question is easy to ask, but difficult to answer. As factors bearing upon the subject the following

are tabulated: (1) The communication theory—the greater opportunities of contact of persons with persons; (2) Epidemic cycles; (3) ‘Epidemic constitution’ of influenza, which is, in the opinion of some, closely allied to cerebrospinal fever, poliomyelitis or polio-encephalitis, and encephalitis lethargica; and (4) Soil and seed in epidemic nervous disease—the rapidity of modern progress and modern life, with the present tendency to ‘nervous breakdowns’, neurasthenia, and other manifestations of nervous fatigue. The strain of the Great War also plays a part. Is it possible that the organisms were formerly harmless parasites of man which have now taken on inimical characteristics? All known and recorded outbreaks are fully set out in the Milroy Lectures, giving geographical distribution and incidence, age, sex and race, mortality, seasonal variations and meteorology, incubation periods, etc.

In relation to the public health, the Great War proved that overcrowding (in billets, hutments, and barracks) favoured the spread of cerebrospinal fever amongst the troops, due to increased opportunities for personal contact, lack of free ventilation, etc. Fatigue also played an important part as a predisposing cause in the war. Poliomyelitis or polio-encephalitis acuta appears to be independent of insanitary conditions, e.g., personal uncleanness or uncleanness of the patient’s surroundings; and the same remarks apply to encephalitis lethargica, except, perhaps, that overwork and fatigue are, in the opinion of some observers, predisposing causes.

Early Diagnosis of Acute Poliomyelitis or Polio-encephalitis as a Preventive Measure.—Much official attention is being paid to acute poliomyelitis or polio-encephalitis with a view to its very early diagnosis and the after-treatment in institutions of patients who are suffering from the sequelæ in later and chronic stages of the disease. The London County Council has organized arrangements (for the Metropolitan area) under which such institutional accommodation is available. Everything depends upon very early diagnosis. Acute poliomyelitis or polio-encephalitis is an infectious disease that attacks the central nervous system and may give rise to paralysis, in the same way as may cerebrospinal meningitis and encephalitis lethargica. Another and better known name for the disease is ‘infantile paralysis’, though it may occasionally affect adults. At times the disease takes on epidemic proportions, e.g., in America, Australia, the Continent of Europe, and (fortunately only locally at present) in parts of England and Wales. The disease is compulsorily notifiable. The causative germ has not been isolated, but it is a filter-passer, and attacks the nervous system, causing inflammation of the grey matter of the spinal cord, especially of its anterior cornua. When the brain and its meninges are also affected (primarily or secondarily), the disease is known as polio-encephalitis (myelitis). The incubation period is probably four to five days, but cases are on record that seem to point to a much longer or even shorter period. The disease is most prevalent in the summer, often occurs in sparsely-populated districts, and varies in its infectivity somewhat erratically. The case mortality is about 10 or 12 per cent.

Mild or so-called abortive cases are the crux of successful administrative action. All such cases must be discovered and, when discovered, isolated in hospital, as well as the ordinary cases. The disease does not appear to have any relationship to social or sanitary conditions. The diagnosis is extremely difficult, especially in the mild cases, the various nervous symptoms being so many, according to the parts of the cerebrospinal system affected. Fever, malaise, and drowsiness (or even stupor), headache, profuse sweating, irritability and restlessness, delirium, twitchings and tremors, rigidity of the neck and spine muscles (with head retraction), retention of urine and various pareses, paralyses of different muscles or sets of muscles, etc., all go to make up the clinical picture. Differentiation is necessary, however, from cerebrospinal

meningitis (the meningococcus in the cerebrospinal fluid), encephalitis lethargica, and tuberculous meningitis (the tubercle bacillus in the cerebrospinal fluid). After the acute stage comes the chronic stage of a paresis or paralysis of particular groups of muscles—crippling taking place in about 50 per cent of the patients and lasting throughout life. Hence the great need of modern treatment at institutions of the paralytic sequelae.

CEREBROSPINAL FEVER. (See also CENTRAL NERVOUS SYSTEM.)

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—P. György¹ states that while the frequency of *herpes febrilis* in cerebrospinal fever is differently estimated by various observers, it may generally be regarded as occurring in 50 per cent of all cases. *Herpes febrilis* in this disease is remarkable for its extensive distribution, its appearance in unusual situations, and an arrangement suggestive of *herpes zoster*. It usually appears from the third to the sixth day, and is never seen below the age of three years. L. Stordeur² records a case of cerebrospinal fever in a girl, age 18, in whom the *cerebrospinal fluid remained hæmorrhagic* for seven weeks in the spinal theca and for more than two months in the lateral ventricles. There was no question of hæmorrhagic diathesis, as was found by determining the bleeding and coagulation time, and the phenomenon was probably due to a specially virulent strain of meningococcus.

The *skin lesions* in meningococcus septicæmia were studied by C. L. Brown,³ who describes a fatal case in a girl, age 2 years, who died after two days' illness, in which the symptoms were a purpuric eruption, a temperature of 104°, and a hyperæmic nasopharynx. The blood yielded a pure culture of meningococci. The cerebrospinal fluid was clear, and the cell-count was not increased. Examination of the skin showed numerous polymorphonuclear leucocytes in the arterioles and capillaries of the corium. Many intra- and extra-cellular Gram-negative diplococci were found in these areas.

The occurrence of *spondylitis* following cerebrospinal fever similar to the condition of 'typhoid spine' is described by R. W. Billington,⁴ who records 35 cases in which there was a complaint of persistent backache dating from an attack of cerebrospinal fever. The cases were divided into the three following groups: (1) Patients with spinal osteo-arthritis with positive skiagrams; (2) Patients with physical signs of spondylitis but negative skiagrams; (3) Patients with no definite signs of spondylitis. This group probably included psychoneuroses, malingering, and the mildest forms of spondylitis. Billington suggests that the lumbar-puncture needle may readily afford a means of inoculating the lower lumbar vertebrae and discs with the meningococcus, and is probably an important etiological factor in the condition. Treatment should be early and prolonged immobilization.

Lesions of the spinal cord are exceedingly rare in cerebrospinal fever. Two types have been described. In the first there are flaccid paralyses localized in one limb or an individual muscle associated with sensory changes of irregular distribution. Such lesions are due to involvement of the nerve-roots, probably from purulent infiltration of the pia-arachnoid sheaths. Complete recovery usually results, but the condition may persist for several months. The second type of lesion, which is rarer, involves the spinal cord itself, and presents the characteristic signs of meningitis. The injury is usually permanent. L. Wilkins⁵ reports a permanent *lesion of the conus medullaris* following cerebrospinal fever in a girl, age 2½ years. The condition was manifested by incontinence of urine and feces, loss of anal and gluteal reflexes, relaxation of the external sphincter, and trophic ulcers round the anus. The knee- and ankle-jerks were elicited with difficulty. X rays showed no evidence of spina

bifida. The Wassermann reaction in the blood and the intradermal tuberculin tests were negative. At the end of three years the child had regained complete control of the bowels, and there was considerable improvement in bladder control, but there was still incontinence of urine during the day.

R. Metz-Klok,⁶ who records an illustrative case, states that *hyalitis*, i.e., inflammation of the vitreous, is not infrequent in cerebrospinal fever, its incidence ranging from 3 to 6 per cent. According to various observers, meningococcic hyalitis differs little from the hyalitis found in puerperal fever, endocarditis, and pneumococcal infections. According to Uhthoff, hyalitis in cerebrospinal fever is usually unilateral: in only 3 out of 12 cases seen by him was it present in both eyes. Metz-Klok's patient was a male infant, age 4 months, who died after about a fortnight's illness. The right eye, which showed masses of greyish exudation in the vitreous, was enucleated after death, when a large thrombus was found in the central vein of the retina. The optic nerve anterior to the lamina cribrosa presented œdema and slight diffuse cellular infiltration, but behind the lamina there were few or no signs of infection.

TREATMENT.—Apart from eighty-one occasions on which he has employed the method for diagnostic purposes, A. Hartwich⁷ has used **Suboccipital Puncture** of the cisterna magna successfully in the treatment of two cases of cerebrospinal fever, the patients being a girl, age 12, and a man, age 22. No bad effects or failure such as a 'dry tap' or mixture of blood with the cerebrospinal fluid occurred in either case. The method is of special value in cases where lumbar puncture gives issue to no fluid owing to the formation of fibrin clots in the subarachnoid space during the acute stage or of meningeal adhesions in convalescence. Suboccipital puncture causes less discomfort to the patient and is more easily carried out than lumbar puncture. Moreover, owing to the necessity of repeated punctures in tuberculous and meningococcic meningitis, it is desirable to have more than one site for puncture available.

REFERENCES.—¹*Klin. Woch.* 1925, 916; ²*Bruxelles méd.* 1925, v, 1023; ³*Amer. Jour. Dis. Child.* 1924, xxvii, 598; ⁴*Jour. Amer. Med. Assoc.* 1924, lxxxiii, 683; ⁵*Amer. Jour. Dis. Child.* 1925, xxix, 67; ⁶*Nederl. Tijds. v. Geneesk.* 1924, ii, 2110; ⁷*Munch. med. Woch.* 1924, 935.

CHANCROID.

Col. L. W. Harrison, D.S.O.

F. S. Schofield¹ shows that the incidence of genital lesions is declining, and that whereas in 1885-86 the ratio of chancreoid to chancre seen in the Urological Service of the University of Pennsylvania Hospital was 63 to 39, in 1915-16 it was 73 to 96, and in 1923-24 it was 61 to 62. Doubtless the high ratio of the 1885-86 period was due to faulty diagnosis, but the ratios of 1915-16 and of 1923-24 will strike the British observer as very high. Thus, in V.D. centres in England and Wales the cases of syphilis seen for the first time in 1924 were 22,010. The reviewer would judge that approximately 20 per cent of the new cases of syphilis were in the chancre stage, making a ratio of 1 chancreoid to 4 chancre in this country. The ratios shown in the U.S.A. are possibly explained by a higher relative incidence in negroes. Schofield has found the Robbins and Seabury method of treatment the most efficacious. After the surface of the lesion has been cleaned with salt solution, it is anaesthetized by covering it with thin layers of cotton soaked in 10 per cent cocaine. Five to ten minutes later the surface is painted with 20 per cent Copper Sulphate Solution, and is then sparked with a Small-pointed Vacuum Electrode, using the Oudin monopolar current. A spark of about $\frac{1}{8}$ in. length is used, and is applied to the surface of the ulcer until this appears a dirty-grey instead of the blue colour left by the copper sulphate. Some of the larger lesions require several fulgurations, but improvement is so marked after the first sitting that patients gladly return for more when required. In 70 cases the average number

of treatments required was 2.2 per patient, and the average time for complete healing was only twelve days. In cases where fulguration is not possible, the author uses **Argyrol** or **Carbol-fuchsin**. Argyrol crystals are packed loosely into the lesions. They may cause moderate pain. If this becomes too severe, the treatment is suspended for a few days in favour of warm salt solution. The carbol-fuchsin is the same as that employed in staining for tubercle bacilli. (In the *MEDICAL ANNUAL* for 1923, p. 124, it was mentioned that Queyrat uses Ziehl's fuchsin, 35 c.c., with watery methylene blue, 15 c.c.)

L. Cheinisse² reviews the **Vaccine and Serum Therapy** of chaneroid, with particular reference to a new method introduced by C. Nicolle and P. Durand. The Reenstierna³ method of injecting a serum prepared from sheep is more useful against bubo than against chaneroid. Stümpke used a vaccine, and Cruveilhier prepared an auto-vaccine by taking the discharge from the chaneroid, diluting it with saline, and heating at 57° C. for half an hour. With this vaccine he treated twelve cases, two of which were phagedenic. Twenty-four to forty-eight hours after the first injection improvement had already commenced, and the patients were free from pain. The new method of Nicolle and Durand⁴ depends on a vaccine which is administered intravenously. The culture is made on the soft agar used in the Tunis Institute for preservation of gonococci and the germ of whooping-cough. It is a 2.5 per cent agar containing 10 per cent of potato starch, with the addition of one-fifth the volume defibrinated rabbit's blood. The material is sown on the surface, and the culture grows down into the medium in long chains. With emulsions of the organisms grown in this way the authors have confirmed the finding of Reenstierna that patients suffering from chaneroid give a cuti-reaction to an intradermal injection; out of 93 subjects, no cuti-reaction was obtained with 30 not suffering from chanere or with a history of such. In 51 cases of chaneroid, a positive reaction was obtained 48 times. The authors consider that the reaction is specific; it is more pronounced the older the lesion, and it has a retrospective diagnostic value, since it may be obtained ten or more years after the lesion appeared. After testifying to the good effects of the Reenstierna method, the authors discuss the question of anti-streptobacillary vaccines. One objection, that the streptobacillus of Ducrey is difficult to grow, has been overcome by the authors' method. The second is that subcutaneous injections of Ducrey vaccine cause violent local reactions. The authors have therefore adopted the intravenous route, giving 1 c.c. to 1.5 c.c. of their emulsion every two or three days, and increasing the dose to 2 or 3 c.c. The injections must not be stopped before the lesions have healed; otherwise a relapse may occur. In 41 cases there was only one failure, and healing was complete in twelve days when there was no complicating bubo: in these the time for healing was sixteen to seventeen days. The effect on buboes is described as particularly brilliant. The authors have commenced the preparation of an antistreptobacillary serum, and hope to study the effect of a combined serum and vaccine treatment of chaneroid. The reagent for the cuti-reaction is made of the emulsion diluted to the opacity of the typhoid emulsion used in serum diagnosis. The vaccine is half this strength.

REFERENCES.—¹*Therap. Gazette*, 1925, Feb., 83; ²*Presse méd.*, 1924, Nov. 29; ³*Med. Annual*, 1925, 84; ⁴*Presse méd.*, 1924, Dec. 27, 1933.

CHEST, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Empyema.—W. H. C. Romanis¹ states that it is important to know the organism present, and it is not sufficient to apply a routine treatment to all cases, consisting in removing a portion of a rib and inserting a tube. In fact, there are probably very few cases indeed for which this last procedure is

suitable, and it must be regarded as out of date. In adults, no matter what the infecting organism is, Romanis thinks that a free opening should be made into the pleural cavity to permit of the removal of all pus and solid masses of fibrin. Whether this should be followed by drainage or complete closure will depend upon circumstances. The only cases in the series mentioned which healed by first intention were those due to the pneumococcus, and it is concluded that to attempt primary closure in the case of other organisms is unwise. Drainage, therefore, is regarded as essential except in early pneumococcal infections. [The reviewer strongly agrees with Romanis when he states that children do not tolerate open drainage of the pleural cavity well, and that siphon or suction drainage has therefore considerable advantages in their case.—W. I. de C. W.] The paper deals with acute abscess of the lung, and states that it is customary to describe three suppurative processes—the chronic abscess, acute abscess, and gangrene of the lung. Acute abscess and gangrene are practically identical.

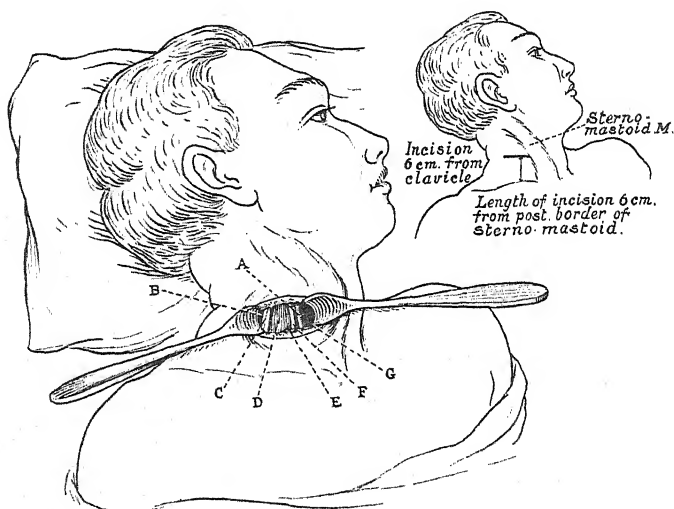


Fig. 5.—Phrenicotomy for progressive tuberculous lesions of lower lobe. A, Ascending cervical artery; B, Scalenus medius; C, Brachial plexus; D, Scalenus anticus; E, External jugular vein (cut and ligated); F, Phrenic nerve; G, Omohyoid.

(Re-drawn from the 'American Journal of the Medical Sciences'.)

It is stated that there is a mortality of 90 per cent of acute abscess of the lung treated by medical means, and that treated by operation the mortality is about 40 per cent—a substantial difference. (See also EMPYEMA.)

After dealing with various methods of thoracoplasty in a paper on "The Surgery of Pulmonary Tuberculosis," J. Alexander² refers to treatment by paralysis of the diaphragm. Phrenicotomy (Fig. 5), for progressive lower lobe tuberculous lesions, especially for a cavity, has been recommended. Complete paralysis of one-half of the diaphragm by interruption of the phrenic causes that half to rise passively into the chest and to remain at rest. The diaphragm atrophies and becomes a parchment-like membrane, and it may be expected to continue to mount into the chest cavity for some months after operation. Clinically, a certain amount of pulmonary rest and compression are produced, especially of the lower lobe. Contrary to expectation, cough

and expectoration are easier after paralysis of the diaphragm than before. Phrenicotomy does not produce respiratory disturbance. Phrenicotomy has certain advantages, but also has the disadvantages of partial procedures.

Operative Treatment of Pulmonary Tuberculosis.—Analysing the four methods for immobilization of the lung, Ziegler³ points out that induced pneumothorax and extrapleural thoracoplasty are the most effectual. Phrenicotomy may be considered as an adjuvant, while Baer's filling, for circumscribed cavities, is used only exceptionally. He believes that the indications are different in pneumothorax and thoracoplasty, but in doubtful cases the latter should be preferred. Of the 600 patients in the Heidehaus tuberculosis institution, nearly 25 per cent were submitted to operative treatment (phrenicotomy not included), and over 50 per cent have been cured for ten years to date.

Operations on the Chest.—Thoracic surgery has made more progress during the last ten years than during the whole of the previous century. The surgeons of the present generation were educated in the fear of directly attacking tumours of the lungs, pleura, pericardium, or heart. Mediastinal tumours were allowed to progress under the assumption that they were malignant, in cases where a radical operation was quite feasible. It has been shown that, in man, the collapse of one lung does not necessarily interfere with the action of the other, and that on opening the chest it is not necessary to provide for complicated apparatus to ensure negative pressure. The complicated and costly chambers in which patients were placed have been abandoned.

During the War it was found that the chest could be opened freely under general anaesthesia, foreign bodies removed, and the pleural cavity thoroughly cleaned, with complete closure of the wound, and recovery by first intention. In civilian practice, apart from traumas comparable to bullet or shell wounds, the radical operation on the chest so successful in the field should seldom be employed. Speaking generally, a simple drainage of the chest by a closed method, such as was suggested by Poynton and Reynolds for empyemata in children (see MEDICAL ANNUAL, 1924, p. 153), is best. If a more extensive operation is indicated, the subsequent drainage should be by such a closed method. In this connection, G. E. Gask⁴ refers to free opening, irrigation, and subsequent closure. He states that a certain number of successful results have been recorded, but the method on the whole cannot be judged a good one in civilian practice. The reason appears to be that in most of the empyemata which arise in civilian practice, the source of infection lies in the lung, and reinfection may soon occur. Gask inquires into the condition of patients who have a collection of pus hidden away in some pocket of the pleural cavity or between the lobes of the lungs, and states that in such conditions there is a good field for sound surgery. He thinks that, in the event of failure to find pus by ordinary clinical methods, a deliberate and planned exploration of the chest by open operation should be undertaken. The operation could be done with safety, and there is no more reason for allowing pus to remain pent up if it happens to be in the chest than if it were in the abdomen. Exploratory thoracotomy should be on the same plane as exploratory laparotomy. The old chronic discharging sinuses which refuse to heal respond well to the operation of decortication. Reference is made by Gask to the presence of fibromata and lipomata, and also teratomata in the mediastinum. These may be successfully removed by the trans-sternal route.

Surgery of the chest suggests at once the recent work on surgical intervention in *mitral stenosis*. Cutler⁵ discusses this question, and records four cases, one of which was successful. In the second case death occurred ten hours after operation, in the third case twenty hours after operation, and the fourth

patient lived six days. The autopsies proved the feasibility of the operation, and although the statistics are discouraging, it must be remembered that to make the operation justifiable these patients must be accepted as deplorable surgical risks.

Guibal⁶ discusses the surgical treatment of chronic bronchial dilatation. In the unilobar forms, especially in those of the lower lobe, excellent results are obtained from operation. Lobectomy for unilobar bronchiectasis may be done either in one or two stages. Lilienthal opens the entire seventh intercostal space and spreads the ribs widely, if necessary with paravertebral section of two or three ribs. He then frees the diseased lobe, ties the pedicle with silk, brings the ribs together, and establishes dependent drainage. Guibal thinks that a two-stage lobectomy is more prudent—the 6th, 7th, and 8th ribs are resected from behind in the axillary line, and the intercostal vessels are ligated. The U-shaped flap is then replaced. Eight days later, the second or intrapleural stage of the operation is performed. He recommends spinal anaesthesia. The lung lobe is freed, the pedicle is clamped, and the lobe is divided at a considerable distance from the clamp. The clamp becomes spontaneously detached, and is removed by about the ninth day. (See also BRONCHIECTASIS.)

REFERENCES.—¹*Practitioner*, 1924, Nov., 331; ²*Amer. Jour. Med. Sci.* 1924, Sept., 412; ³*Zeits. f. Tuberkulose*, Leipzig, 1924, Sept., 481 (abstr. *Jour. Amer. Med. Assoc.* 1924, Nov. 15, 1628); ⁴*Brit. Med. Jour.* 1925, i, 343; ⁵*Trans. Amer. Surg. Assoc.* 1924, xliii; ⁶Abstr. in *Surg. Gynecol. and Obst.* 1924, Oct., 289.

CHICKEN-POX.

J. D. Rolleston, M.D.

BACTERIOLOGY.—L. Auricchio¹ obtained from the blood and vesicular fluid of twenty chicken-pox patients a Gram-positive filterable micro-organism in the form of cocci and diplococci which grew anaerobically on catalysing media only. The serum of patients in an advanced stage of the disease and in convalescence constantly showed the presence of agglutinins and complement-fixation reactions. Intravenous inoculation of the cultures into young rabbits produced some constitutional disturbance, but no cutaneous manifestations.

ETIOLOGY.—Sicard and Paraf² summarize the objections to the identity of chicken-pox and herpes zoster as follows: (1) Varicella confers immunity against varicella, but not against zoster. Varicella never relapses, but zoster may occur in persons who have had varicella. [This statement requires modification, as recurrence of varicella, though rare, undoubtedly does occur. —J. D. R.] (2) Varicella can be produced in children by inoculation of varicella vesicles, whereas therapeutic inoculation of the fluid of zoster intradermically and subcutaneously in patients suffering from encephalitis has never been followed by the slightest local or general reaction. (3) Spinal lymphocytosis, which has been shown by Brissaud and Sicard to occur in zoster, is not found in varicella. (4) Inoculation of the rabbit's cornea with serous fluid from varicella vesicles produces keratitis, whereas inoculation of fluid from zoster vesicles does not cause any local irritation. (5) In a case recently observed by the writers, inoculation of the serum of a zoster patient did not protect children from varicella.

SYMPTOMS AND COMPLICATIONS.—Cases of concurrent varicella and herpes zoster are recorded by E. C. Aviragnet, J. Huber, and Dayras,³ and by P. Gautier and Peyrot⁴ respectively. The case reported by the first-named writers was that of a girl, age 14, in whom herpes was recognizable by three distinct patches: the first in the seventh intercostal space external to the left breast, and the second and third in the tenth and eleventh intercostal spaces respectively. The case reported by Gautier and Peyrot was in a girl, age 5, who in addition to a typical eruption of varicella presented herpes zoster in the region of the left sciatic nerve. The simultaneous occurrence of the two

affections does not appear to be an argument in favour of the identity of varicella and herpes zoster, but should be regarded merely as an accidental association such as may be seen in concurrent infection of varicella and measles or of measles and zoster.

PROPHYLAXIS.—Z. von Barabás,⁵ as the result of a trial of various prophylactic methods, came to the following conclusions: (1) Inoculation of the contents of varicella vesicles is unreliable. (2) More successful results are obtained by inoculation with Serum obtained from blisters. (3) The objection to the systematic use of the serum of convalescents from varicella is the difficulty in obtaining large quantities of such serum. (4) The simplest method both in private and hospital practice, though not absolutely reliable, is the injection of the whole **Blood of Varicella Convalescents** in doses from 10 to 15 c.c.

REFERENCES.—¹*Pediatrics*, 1924, 1305; ²*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1925, 301; ³*Ibid.* 105; ⁴*Arch. de Méd. des Enf.* 1925, 306; ⁵*Jahrb. f. Kinderh.* 1925, cvii, 343.

CHILDREN, DISEASES OF. (*See* ACIDOSIS, POST-OPERATIVE; CÆLIAC DISEASE; FACIAL IRRITABILITY; MONGOLIAN IMBECILITY; NEWBORN, HÆMORRHAGE IN; OBESITY IN CHILDREN; PANCREATIC DISEASE, CONGENITAL; PYLORIC STENOSIS; RHEUMATIC INFECTION IN CHILDHOOD; RICKETS; SYPHILIS, CONGENITAL; TETANY; TUBERCULOSIS, PULMONARY, IN CHILDHOOD.)

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—A. B. Fry¹ answers a question of the Office Internationale d'Hygiène, as to whether Bengal continues to be the endemic home of cholera from whence it spreads over India, in the affirmative, as the data since 1889 show that the disease is never bad in other parts of India unless there is a high mortality in Bengal, and that it still spreads westward from Bengal as described by Bryden in 1874, by either a northerly route through the United Provinces to the Punjab, or by a more southerly one through the Central Provinces to Bombay and Madras. In Eastern Bengal and the Presidency division around Calcutta the disease increases in December and January, and again in the spring; but in Bihar and the United Provinces to the west its maximum is in the rainy season from June onwards. Before the days of many railways the spread west was slow and easily traced, but now it is more rapid and difficult to follow. He attributes the endemicity in Lower Bengal to the water-supply being from frequently polluted tanks, and suggests a trial of intensive vaccination and propaganda. [From recent independent unpublished investigations I can confirm all the foregoing statements.—L. R.] A. J. H. Russell,² in a short note, states that he has discovered that in Madras over a period of twenty-five years cholera has shown a regular six-yearly cycle of increase and decrease, and that the same is true of Bombay, the Punjab, the United Provinces, and the Central Provinces. As far as he is aware, "no such periodic trend has previously been demonstrated in connection with this disease". Rogers, in a brief letter,³ draws attention to Bellet's book of 1885 in which he describes a 'three-year' cholera cycle in India, and states that if a sufficiently long series of years is examined the periodicity is not very regular.

G. C. Maitra⁴ has inquired into the origin of cholera outbreaks in the Bengal coalfields, and found, apart from the epidemic prevalence of the disease, scattered cases of vomiting and diarrhœa reported as suspected cholera, but in which he could find no cholera vibrios, two such cases being seldom seen in the same house or village at one time. On the other hand, three small outbreaks in groups with two or more cases in the same house or village were proved by bacteriological methods to be true cholera, and were traced to

infection introduced by returned pilgrims from Puri and other pilgrim centres : a common event which is very difficult to guard against, and necessitates the presence of small local laboratories for the immediate investigation of such outbreaks, permitting of early steps to prevent the spread of the disease.

DIAGNOSIS.—G. C. Maitra, L. B. Gunguli, and J. B. Basu² have investigated the diagnosis of cholera in the wards of the Calcutta cholera hospital in 550 cases, and obtained positive results by bacteriological methods in 84 per cent ; a high specific gravity by Rogers' method in 92 per cent, while in only 2 per cent of very mild cases was there no concentration at all ; and in 98 per cent they found, by examining films of the mucus stained with carbol-fuchsin, degenerated epithelial cells, which they regard as a characteristic and reliable index of the presence of cholera of a simple and easily ascertainable nature.

REFERENCES.—¹*Ind. Med. Gaz.* 1925, July, 301; ²*Lancet*, 1925, i, 1237; ³*Ibid.* June 20, 1922; ⁴*Ind. Med. Gaz.* 1925, March, 97; ⁵*Ibid.* July, 324.

CHVOSTEK'S SIGN. (*See* FACIAL IRRITABILITY.)

CLAUDICATION INTERMITTENT. (*See* HEART DISEASE, GENERAL THERAPEUTICS—DIATHERMY.)

CLEFT PALATE. (*See* FACE AND MOUTH, PLASTIC SURGERY OF.)

CÆLIAC DISEASE.

Reginald Miller, M.D., F.R.C.P.

Cœliac disease has long been known to be a cause of tetany in children past the age of infancy, and less commonly of other symptoms of spasmodophilia. C. McNeil,¹ investigating the prevalence of Chvostek's sign of 'Facial Irritability' (q.v.), tested 8 cases of cœliac disease. Although in 2 of these the diagnosis was doubtful and facial irritability absent, he found the sign positive in 5 cases : an unusually high proportion, one would think. Of these 5 cases, one showed tetany and another recurring convulsions of a mild type. He regards this association as probably due to the excess of calcium loss in the fatty stools characteristic of cœliac disease.

F. J. Poynton and L. B. Cole² report a case of cœliac disease complicated by diabetes mellitus. The child, a boy, had suffered from cœliac symptoms since the first year of life, and at the age of 6½, when he first came under the authors' observation, he was considerably under the normal height as the result of it. At that time he had an attack of acute diarrhoea with evidence of colitis, and three months later suffered from thirst and was found to be passing 6 per cent of sugar in the urine. His blood-sugar was raised, but the urine showed no more than a trace of acetone at any time. The particular interest of this case lies in the connection between the fatty stools of the cœliac disease and the glycosuria of pancreatic type. From the analyses of the faeces the authors conclude that the excess of fat in the stools was not due to pancreatic deficiency, and the clinical history proves that the cœliac symptoms preceded the diabetic by some years. In spite, therefore, of the association of the excessive fat-loss in the stools with glycosuria, there is no more evidence in favour of a pancreatic origin for cœliac disease here than in the ordinary examples of that malady. A possible explanation is advanced by the authors as follows. The failure in fat absorption in cœliac disease throws an added strain on carbohydrate metabolism and thus on the islet tissue of the pancreas : this continued to function correctly until from an attack of diarrhoea poisons acted upon it, causing glycosuria to be established. Under such circumstances recuperation would be difficult ; yet it is not easy to explain why a similar sequence of events has not occurred in other severe

PLATE V.

COELIOSCOPY

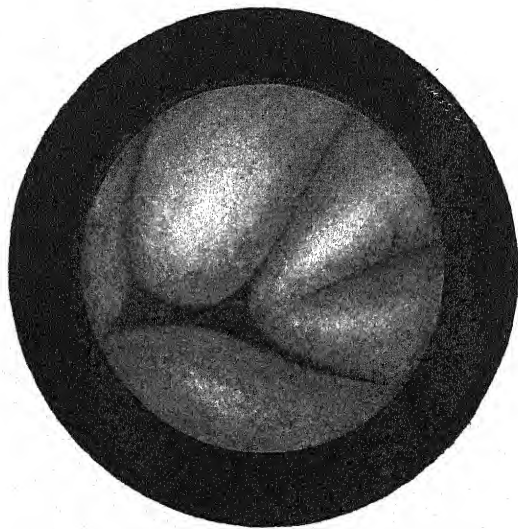


Fig. A.—Normal small intestine.



Fig. B.—Malignant metastasis in the liver.

cases of persistent cæliac disease. It is interesting to note the comparative lack of acetoneuria in this case, probably due to the small amount of fat absorption from the intestine.

REFERENCES.—*Edin. Med. Jour.* 1924, Dec., 651; *Brit. Jour. Child. Dis.* 1925, xxii, 30.

CÆLIOSCOPY.

A. Rendle Short, M.D., F.R.C.S.

In a certain small number of cases, the risks of an exploratory laparotomy can be avoided by making a tiny incision in the middle line below the umbilicus, either under novocain or a general anæsthetic, inflating with air by an ordinary hand-bellows (with a wool filter to catch germs), and examining with a cystoscope. One commences by looking at the liver, with the head of the table slightly raised. The procedure is practically painless, and does no harm; the patient can get up next day.

By this means we can inspect the structures that lie on the surface, but obviously not those that lie deeper. Nodules due to tuberculous or malignant peritonitis, metastases in the liver, hob-nail liver, and tumours can be seen. If no general anæsthetic is used, peristalsis can be watched.

The illustrations shown (*Plate V*) are from two separate cases.

BIBLIOGRAPHY.—Kelling, *Munch. med. Woch.* 1902, i, 21; Jacobæus, *Ibid.* 1910, xl, 2090; Steiner, *Surg. Gynecol. and Obst.* xxxviii, 266; Rendle Short, *Brit. Med. Jour.* 1925, ii, 254; Geary Grant, *Ibid.* 310.

COLD, THE COMMON.

W. H. Wynn, M.D., F.R.C.P.

The common cold or coryza, an acute infection of the mucous membrane of the upper air-passages, is by far the most prevalent form of disease, and is responsible for a greater loss of working time and efficiency than any other disorder. It is therefore singular that so little is known about its etiology. We do not know whether all types of colds are contagious, whether they are caused by one specific micro-organism or not, and we do not know with certainty the relation to climatic conditions, cold, damp, bad ventilation, and the many factors which have been incriminated.

Several large-scale observations upon the prevalence of colds have been made in America. The United States Health Service¹ sent a questionnaire to 13,000 persons in eleven localities from Massachusetts to California, requesting information as to past colds, influenza and pneumonia, habits, the kind of clothing worn in winter, the amount of exercise taken, and the average number of colds contracted in a year. Bi-monthly reports were then obtained. These reports showed that the common cold has in all localities certain periods when they may be called epidemic, and there was a remarkable synchronicity in the rise and fall in different localities. A high incidence in the latter part of October was followed by a fall continuing to the latter part of December, when a sharp rise occurred in all places, reaching its peak in the first week in January, and followed by a gradual fall. About 90 per cent of 1272 persons suffered from one or more colds during the eight months from October, 1923, to June, 1924. During five and a half months there was an average of two colds per person.

The Metropolitan Life Insurance Company² find that among 6700 clerks there were 2824 colds in one year ending July, 1923, a rate of 420.7 per 1000 per year. The average disability was 0.9 per person. The average number of days absent per case was 2.2. In all, 6233 days were lost. The maximum number of colds occurred in the early autumn and in January to February. A drop of ten degrees in the weekly mean temperature caused an increase of 18 colds per week in this group of 6700. Mean relative humidity and total precipitation had only a slight influence.

Allen,³ of the John Hancock Mutual Life Insurance Company, states that in 1924, in 300 working days, of 2000 employees the number absent from work was 651, and the number of days lost 1202. In 1923, 634 were absent and 1962 days lost.

D. F. Smiley⁴ obtained monthly records of acute respiratory infections in male students at Cornell University for four years. In each year there was a rise to a maximum in January to February, followed by a gradual fall; 23 per cent had four or more colds per year, 60 per cent two to three colds, and 17 per cent one or none. 1919-20 was an epidemic year, in 1920-21 colds were less prevalent, in 1921-22 they increased, and in 1922-23 again reached epidemic proportions. Smiley accounted for the seasonal prevalence by the time spent in closed heated rooms. Tobacco, dust, gas, mouth-breathing, draughts, constipation, footwear, and perspiration were not major factors in determining the onset of colds. Exercise appeared to be a liability rather than an asset, possibly because of insufficient care during fatigue. Woollen underwear appeared to predispose to colds, as there were 19 per cent more in those wearing wool. Nasal obstruction and diseased tonsils were not major factors, and operations on the nose and throat did not reduce the incidence of attacks.

E. O. Jordan, J. F. Norton, and W. B. Sharp⁵ made a study of colds in 2300 students in Chicago, Galveston, and Pasadena. It was found that colds generally began in the nose, and about one-third went to the chest. No definite correlation could be found between the type, duration, severity, and frequency of colds, except that infrequent colds tend to run a milder course. Sixty-four per cent believed that their colds were due to some strain upon the heat-regulating mechanism, and 22 per cent thought that their colds were contracted from others. Practices alleged to 'build up resistance' apparently had little effect upon the frequency. There was no evidence that nose and throat operations diminished the liability to colds, or that seasonal occurrence bore any relation to the duration or type of cold. Bacteriological investigations did not show predominance of any one micro-organism.

Leonard Hill and A. Campbell⁶ hold that there is no proof that exposure to chill and draughts causes colds in healthy persons not exposed to infection. Colds are attributed to chill because they are ushered in by a chilly feeling many hours after the infection that caused them. Persons with colds coming on are more susceptible to cold owing to the derangement of the heat-regulating mechanism by absorption of toxins. Epidemics of colds are more common when the humidity of the atmosphere is great and the temperature variable but on the whole cool; when the weather is raw, with thawing snow; or winds blow charged with cold rain, and the ground is wet and cold. Cold dry weather and strong drying winds do not favour colds. Bond, of Winnipeg, reported in 1913 that a week of breezeless foggy weather in Winnipeg caused more bronchitis, pneumonia, and colds than usually occurred in the whole Manitoba winter. Bad ventilation is undoubtedly the commonest cause of colds. It increases the risk of infection, but in addition it produces unhealthy conditions of the nasal and respiratory mucous membrane. Men living open-air lives are free from colds whatever exposure to extremes of weather they undergo. In badly ventilated rooms in which the air is warm and stagnant the mucous membrane of the nose becomes swollen, congested, and covered with thick secretion. A probe pushed into the swollen membrane forms a pit. On the other hand, under cool open-air conditions the mucous membrane is pale and taut, the airway being much wider than under warm stagnant conditions. Also, in the cool air the membrane is well moistened with secretion, and bacteria are washed out. An occupant on passing out from a badly ventilated room

to the open-air subjects his nasal mucous membrane to a great strain which accentuates the trouble. In badly ventilated rooms, not only is the head too warm, but the feet are too cold, owing to the floor level being cooler than the head level. The opposite condition—cool head and warm feet—is the ideal. Out of doors the feet are often cold but the head is cold too. The indoor conditions of cold floor and warm stagnant air around the head produce congestion and swelling of the nose. Cool out-of-door conditions greatly increase the evaporation of fluid from the surface of the mucous membranes, and therefore the flow of blood and lymph through these membranes. Exercise, by increasing the volume of air breathed, still further increases the flow of blood and lymph, and promotes healthy conditions.

BACTERIOLOGY.—There is no agreement as to the bacterial cause of colds. Various organisms—*M. catarrhalis*, *B. influenzae*, pneumococcus, streptococcus, staphylococcus, *B. septus*, *M. paratetrageus*, and *B. Friedländer* have been described in connection with colds, their incidence varying at different seasons, now one and now another type predominating; so that different observers have been variously impressed with the etiological importance of one or other of these organisms. *M. catarrhalis* and *B. septus* have especially been indicated, and in Osler's text-book coryza is defined as an acute infection of the mucous membrane of the upper air-passages associated with the presence of the *M. catarrhalis* alone or with other organisms. But *M. catarrhalis*, although a very common organism, is by no means invariably present, and in recent years *B. influenzae* has occurred almost more frequently in cultures from swabs taken from the nasopharynx. A difficulty in accepting these organisms as causative is the fact that they can be found in healthy persons in much the same proportions. Gordon⁶ examined 110 persons, none of whom had knowingly been exposed to colds or had recently suffered from colds. Cultures were taken in practically all the months of the year, and no seasonal variation was found. Of the 110, 51, or 46 per cent, showed the presence of *M. catarrhalis* in the nose, nasopharynx, and throat. He then studied 119 persons suffering from colds twenty-four to forty-eight hours after the onset of symptoms, and *M. catarrhalis* was found in 54, or 45 per cent.

A further difficulty is that these organisms, whilst abundantly present in the later stages of a cold, may be absent from the early watery secretion, which may be sterile or show only a few staphylococci.

The possibility of the causal organism being a filter-passer has been investigated. Kruse,⁷ in 1914, transmitted colds by instilling diluted filtered nasal secretion into volunteers. Foster⁸ repeated and confirmed Kruse's experiments. He prepared filtrates from the nasal secretion of persons with colds. The nasal secretion was blown into a sterile Petri dish and mixed with 10 c.c. of 0.8 per cent salt solution. This was well shaken and passed through a Berkefeld filter. Ten soldiers were then inoculated with this filtrate by placing three to six drops well back in each nostril. Nine of the ten developed typical symptoms of a 'cold' in eight to thirty hours. These symptoms persisted for three to six days. Cultures and subcultures of the filtrate were made on Noguchi medium and incubated seven days. Filtrates from these subcultures were diluted with salt solution up to 1-90,000. Eleven soldiers were then inoculated with this diluted filtrate in the same way as before. In from eight to forty-eight hours all the eleven men developed acute colds. No definite micro-organism could be grown from any of the cultures. Under the dark field of the microscope a profusion of minute bodies were seen. P. K. Olitsky and J. E. McCartney⁹ also found a filterable agent in nasopharyngeal washings during the very early stages of a cold. At least, the symptoms of a common cold were transmitted to a number of healthy persons. Transmission

failed when the colds were caused by exposure or by chilling, and not by contagion. R. C. Robertson and R. L. Groves¹⁰ failed to confirm these results. Nasal secretion from ten persons with uncomplicated coryza was diluted and passed through a Berkefeld filter, and then sprayed on the nasal mucosa of 100 volunteers. No convincing evidence of a filter-passer was obtained. During the onset and early stages of a cold there was a marked diminution of the normal inhabitants, especially *Staphylococcus albus*, but during the purulent stage there was a marked increase of all organisms, with later on a return to the normal flora.

[The problem of the common cold thus resembles that of epidemic influenza, in which there is the same doubt whether the bacteria which can be readily isolated—*B. influenzae*, pneumococci, and streptococci—are sufficient to account for the phenomena, or whether a filterable organism is the primary cause, the others being important secondary agents responsible for the complications.]

It seems probable to the reviewer that, excluding the non-bacterial rhinorrhœas due to protein sensitization as in hay fever, and also the coryzas occurring at the onset of known diseases such as measles, influenza, etc., there may be two classes of 'colds': (1) Those caused by an unknown filterable virus, the ordinary nasal organisms such as *M. catarrhalis*, *B. influenzae*, pneumococcus, etc., being important secondary factors, whose activity is enhanced by the primary infection, and which are mainly responsible for the complications such as bronchitis, middle-ear disease, sinusitis, etc. These colds occur in epidemic form, have a seasonal variation, and are not greatly influenced by secondary factors such as cold, damp, ventilation, etc., although, as with influenza, infection occurs more readily in places where people congregate. These colds are definitely contagious. Few persons seem immune to them, and they attack the healthy equally with the delicate. Persons living under open-air conditions are less likely to suffer from them, owing to the less chance of infection. Such are the colds which most persons experience once or twice a year. (2) Colds caused by one or more of the ordinary catarrhal organisms without the presence of a specific virus. They may be left as a legacy by epidemic colds, one or more of the secondary organisms becoming established in the nose or nasopharynx. The patient is a 'carrier', and the 'colds' represent an exacerbation of the persistent infection. They are much less contagious, do not occur in epidemic form, and although more prevalent with the onset of cold weather do not show the same definite seasonal variations. An exacerbation may be excited by fatigue, alimentary tract disturbances, bad ventilation, and other conditions lowering resistance or causing unhealthy conditions of the nasal mucous membrane. It has been shown that some patients exhibit cutaneous sensitiveness to *M. catarrhalis* or some other catarrhal organism, which suggests that some of the early symptoms of a cold, e.g., the sudden outpouring of mucus, may be an expression of an allergy of the mucous membrane to the proteins of these organisms.—W. H. W.]

PROPHYLAXIS should begin at birth. R. C. Clarke¹¹ has recently called attention to the great frequency of respiratory catarrh in young infants. He found 499 of 1000 children of the poorer classes from 3 to 6 weeks old already infected, and, in every baby under 4 weeks old who had had nasal catarrh, signs of bronchial catarrh were found. After three months the liability to extension to the bronchi became less. The development of respiratory catarrh, he suggests, depends upon two factors: (1) The number and virulence of the organisms which attack the mucous membrane; and (2) The local resistance of the membrane and the general immunity of the body. A morbid dose of infection may be obtained either by a direct hit from a cough, or by staying too long in air heavily laden with germs. The mucous membrane of young

infants appears to be deficient in resistance, and, if subject to early and repeated attacks, either loses or fails to acquire an adequate resistance. A normal child probably acquires resistance by frequent submorbid doses of infection. Doses big enough to cause an inflammatory reaction, however, probably do not confer immunity, but cause more or less permanent damage to epithelium. The morbid dose must be postponed as long as possible, and attention must first be directed to the mother. If she suffers from a chronic infection of the upper air-passages, antenatal hygiene and treatment must be carried out. If she has an acute catarrh when the baby is born, a direct hit is difficult to avoid, but she should be instructed to wear a folded handkerchief over the mouth and nose when attending to the child, and persons coming to view the infant should be rigorously excluded if suffering from colds. A germ-laden atmosphere can be avoided by bringing up the infant under open-air conditions.

In the child of school age, much can be done by open-air habits and proper ventilation of home and school. The superiority of open-window ventilation for schools has been established. In Washington¹² it was found that absences from 'colds' were on the average six times more numerous in schools ventilated by the 'plenum' systems than in one ventilated by open windows. A common fault in ventilation is the draught of cold air along the floor, whilst the air at head level is overheated. Both in schools and houses much could be done to prevent cold feet and stuffy noses by having floors warmed and fresh air admitted a few feet above head level. The beneficent effect of the open-air school is shown by the following extract from the report of the Chief Medical Officer of the Board of Education:¹³ "Most of the children are, on entering the school, dull, listless, anæmic, and dejected. After a few weeks at the open-air school they are bright and alert, quick to perceive a joke, and full of the joy of life which is their birthright. Pure fresh air, rest, cleanliness, and wholesome food have performed their usual miracle. Children specially selected by reason of their habitual delicacy, not only survive the ordeal of the open-air school through a winter of such exceptional severity as 1916-17, but manifest a most astonishing access of health and vigour". Cold baths, sensible clothing adapted to the environment, avoidance of over-fatigue, sunlight, and an adequate diet with sufficiency of vitamins, are other obvious means of establishing resistance.

Vaccines.—Until the true infective cause of colds is known, the use of vaccines for prophylaxis is necessarily empirical, but there is much authoritative opinion that a vaccine composed of the ordinary catarrhal organisms does confer some protective power. A distinction must be made between the healthy person who suffers from a cold once or twice a year and in the intervening periods is quite well, and the person who suffers from repeated colds and is presumably a carrier, the 'colds' being exacerbations of a latent infection. In the former case, four to six fairly large doses of a mixed catarrhal vaccine in the early autumn may prevent a cold during the following season. The amount of protection gained is more or less proportional to the final doses of vaccine given. Many are content to give two prophylactic doses, but then either the second dose is smaller than advisable, or, if large, may entail some general or local discomfort. A stock vaccine must necessarily be used unless the patient is known to be particularly susceptible to one organism and an autogenous vaccine of this was made at the time of an active cold. There does not appear to be any advantage in using detoxicated or sensitized vaccines. The vaccine should contain various strains of the pneumococcus, *B. influenzae*, *M. catarrhalis*, *B. Friedländer*, *B. septus*, streptococci, and staphylococci. Stock vaccines of these in various proportions are on the market. A vaccine containing 1000 million of each organism in 1 c.c. is preferred by the

reviewer, and of this, 0.1, 0.2, 0.4, 0.6, 0.8, and 1 c.c. can be given at weekly intervals. Where the possibility of a slight reaction does not matter, the course can be shortened by giving only three or four doses, e.g., 0.2, 0.4, and 0.8 c.c. These doses should not be given to the chronic carrier, who should have an autogenous vaccine made from cultures from the sputum or swabs from the nasopharynx. As such a patient is sensitized, treatment must be commenced with quite small doses. A high degree of temporary immunity may be obtained, even although the infection may persist. As a relapse will occur when the immunity has worn off, it will be necessary to repeat the course of injections each year, unless, as frequently happens, the patient ceases to be a carrier. In the wholesale vaccination of public-school children, as many will be carriers and it would be difficult to individualize, much smaller doses than those given above should be used, but injections given twice a year at the beginning of the autumn and spring terms.

G. E. Friend¹⁴ has carried out two mass inoculations at Christ's Hospital. The first was in the winter of 1918, when 633 boys—73 per cent of the school—were inoculated with several strains of the influenza bacillus. There were 186 local reactions, 35 focal reactions (sore throat, recurrence of an ear discharge, or acute cold), and one general reaction. There were no cases of influenza following in the school, though there were several cases among unvaccinated members of the school staff. In 1920, 762 boys were inoculated, and again no cases of influenza occurred. The immunity appeared to be brief, as in the term following the one in which the first inoculation was given an influenza epidemic occurred in the school. The actual doses given are not reported. G. L. Bunting,¹⁵ at Tonbridge School, used Parke, Davis's anticatarrhal vaccine, and gave 0.2 c.c. followed by 0.4 to 0.6 c.c. according to the size of the boy. Regular inoculations were carried out for five or six years. In the first year 80 per cent of boys were inoculated, and the results are described as sensational. At school chapel, where previously the preacher could scarcely hear himself speak, there was scarcely a cough to be heard. In subsequent years fewer were inoculated, but always more than 65 per cent, and good results were obtained. S. P. Huggins,¹⁶ at Wycombe Abbey, also found that the result of inoculations was to make the school much more free from colds and minor sickness.

TREATMENT.—There have been many attempts to abort colds, but it cannot be said that any method is superior to the popular old-fashioned remedy of making the patient sweat. A drink of **Hot Lemonade** with or without a tablespoonful of **Brandy** or **Whisky**, and 10 gr. of **Dover's Powder**, and then bed with a hot-water bottle and extra blankets, is as efficacious as any method. No drug will cut short the disease, though some may be useful in promoting perspiration. **Antiseptic Sprays**, e.g., collosol argentum, neoprotosil, and other silver preparations, are much used, but are more valuable at a later stage. Poulton¹⁷ speaks highly of W. Glegg's treatment. A nasal funnel is filled with a mixture of 1 part **White Vaseline** and 3 or 4 parts of **Liquid Paraffin**. This is allowed to run down each nostril in turn with the patient in a recumbent position, until it is felt in the nasopharynx, when it may be swallowed. This process is repeated four-hourly. A. Bottner¹⁸ recommends 2 per cent **Collargol** for prompt use at the onset of symptoms, 1 to 2 drops to the conjunctiva of the lower lids and 4 or 5 drops intranasally. P. Chaton¹⁹ instils into the eyes of young infants 10 per cent collyrium of **Argyrol** two to three times a day. He has used it for ten years, and claims considerable success. Sprays containing adrenalin and (or) atropine give temporary relief by checking secretion, but they have little effect on the swollen mucous membrane, and, as the secretion of mucin is a means of defence, these drugs should be avoided. When the infection is established, cleansing **Alkaline Douches** or **Sprays**, followed by a

Colloidal Silver preparation, are useful. Oily sprays of Menthol, Camphor, and Eucalyptol are also soothing. Medicated steam inhalations containing Compound Tincture of Benzoin, Oil of Pine, or Menthol are useful when there is laryngitis. Inhalation of Chlorine has had some vogue in the United States, mainly as a result of E. B. Vedder's observation that workers in a chlorine plant entirely escaped influenza during the great epidemic. Vedder placed patients with colds in a small chamber where they inhaled chlorine at a concentration of 0.015 mgrm. per litre. In a large series, 74 per cent of patients with colds were cured and 25 per cent improved. Colds that were treated early were nearly always aborted. Machines are now on the market for carrying out the chlorine treatment. R. L. Cecil²⁰ obtained replies to a questionnaire from 190 doctors, and of these, 70 per cent gave favourable report and 12 per cent unfavourable, the rest being non-committal. H. S. Diehl²¹ fitted up a chlorine room at Minnesota University and treated 425 students with colds, 392 other students being given ordinary medical treatment. He found the best results with acute rhinitis, and that the percentage of patients who recovered within one day with the chlorine treatment was definitely higher—23.6 per cent—than with medical treatment, 6.7 per cent. The best results were obtained when treatment was given on the second or third day. L. I. Harris,²² however, who conducted a chlorine gas clinic for the New York Health Department, failed to get good results. Only 6.5 per cent of 506 persons with various respiratory infections are reported as cured.

Vaccine Treatment has not been much used hitherto for acute colds, although widely used for chronic catarrhal infections. It is the experience, however, of many that the prompt injection of a mixed vaccine has aborted or shortened acute attacks. A formula for a stock vaccine commonly used for these cases is pneumococci 30 million, *B. Friedländer* 50 million, staphylococci 30 million, *M. catarrhalis* 30 million, *B. sepius* 50 million, *B. influenzae* 300 million, streptococci 12 million in 1 c.c. Of this, $\frac{1}{2}$ c.c. should be given as early as possible, and repeated or increased in forty-eight hours. A difficulty in giving vaccines for acute colds is that of knowing whether the patient is sensitized or not. If the patient has only one or two colds of the epidemic variety a year, a comparatively large dose can be given with some hope of aborting the attack; but if the cold is an exacerbation of a chronic infection, the patient must be assumed to be sensitized, and not more than 0.1 c.c. of the above vaccine should be given, and carefully regulated according to indications.

Floyd²³ gave three or four injections of a combined vaccine early each autumn and again in the spring. If a cold occurred in the interim, an injection was given within the first twelve hours of the onset. He reports that one or two injections usually brought about a rapid termination of the cold. Sherman²⁴ uses a polyvalent mixed vaccine of 2 million streptococci, 30 million pneumococci, 100 million *M. catarrhalis*, and 200 million staphylococci as an initial dose, to be given as early as possible after the onset of a cold, and repeats this on the second or third day, with a somewhat larger dose two days later. He finds marked improvement in twenty-four hours, with a cessation of the acute irritating symptoms.

REFERENCES.—¹*U. S. Pub. Health Rep.* 1924, xxxix, 2669; ²Quoted by G. B. Rice, *Boston Med. and Surg. Jour.* 1925, May 14, 959; ³*Jour. Amer. Med. Assoc.* 1924, Feb. 16, 540; ⁴*Health and Environment*, 118; ⁵*Boston Med. and Surg. Jour.* 1925, May 14, 960; ⁶*Munch. med. Woch.* 1914, lxi, 1547; ⁷*Jour. of Infect. Dis.* 1917, xxi, 45; ⁸*Jour. of Exper. Med.* 1923, Oct., 427; ⁹*Ibid.* 1924, April, 329; ¹⁰*Lancet*, 1925, ii, 864; ¹¹*Ibid.* 1925, ii, 864; ¹²*Health and Environment*, 57; ¹³*Brit. Med. Jour.* 1925, ii, 902; ¹⁴*Ibid.*; ¹⁵*Modern Technique in Treatment*, 117; ¹⁶*Munch. med. Woch.* 1921, lxxviii, Oct. 7, 40; ¹⁷*Lyon Méd.* 1924, cxxx, Oct. 18, 19; ¹⁸*Colds*, 91; ¹⁹*Jour. Amer. Med. Assoc.* 1925, May 30, 1629; ²⁰*Colds*, 92; ²¹*Ann. of Otol., Rhinol. and Laryngol.* 1924, Dec.; ²²*Vaccine Therapy in General Practice*, 100.

COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

C. Ive,¹ in a study of six cases, got no constant bacteriological findings, but in no case were any bacilli of the dysentery group isolated. Agglutination tests, however, were not made. [The present reviewer has made such tests in many cases of ulcerative colitis, but always with negative results.] In all Ive's cases the Widal reaction was absent and the *Entamoeba histolytica* or its cysts were not found. Borgen,² in 22 cases from the Mayo Clinic, also failed ever to find dysentery bacilli or amœbæ; but in smears from the colon two organisms predominated, a Gram-positive diplococcus and a Gram-negative bacillus. By the intravenous injection into rabbits of pure cultures of the diplococci or of a mixed culture of the two organisms, lesions resembling those of ulcerative colitis were produced. On the other hand, J. M. Lynch and J. Felsen³ have studied the bacteriology in eleven cases without coming to any definite result.

TREATMENT.—There is little new to be said about the treatment. All writers are agreed as to the advantages of Rest, of an abundant but unirritating Diet, and of Intestinal Irrigation. There is a general consensus of opinion that Permanganate of Soda or Potash is the best antiseptic for irrigating with (1-1000 to 1-10,000), used in large quantities two or three times daily. Crohn and Rosenberg⁴ favour Neutral Acriflavine (1-4000 saline), beginning with about one and a half pints twice a day, the fluid being retained from ten to twenty minutes.

Vaccines have not proved of definite benefit in the hands of any of the writers. The intravenous injection of Antidysenteric Serum which was advocated by Hurst (see ANNUAL, 1924), was tried in four cases by Ive, but the results were less constant and dramatic than the author of the treatment obtained in his cases. Crohn and Rosenberg tried it in two cases. In both there were alarming manifestations of protein shock following the injection. One patient improved markedly; the other derived no benefit.

Drugs by the mouth are admittedly of little value, and are chiefly of use to meet special symptoms. Logan,⁵ however, has reported the cure of three cases by the administration of 10 min. of Tincture of Iodine three times daily. Magnesium Sulphate (1 drachm every morning) is of use in preventing the formation of scybala, and also helps in irrigating the bowel. Flatulence may be relieved by Animal Charcoal (half an ounce made into an emulsion with milk or sweetened) given half an hour after meals. Large doses of Bismuth or Kaolin may be used to lessen the diarrhoea. Opium in small doses (3 min. of the tincture) is the best reliever of pain.

REFERENCES.—¹*Guy's Hosp. Rep.* 1925, Jan., 35; ²*Jour. Amer. Med. Assoc.* 1924, Aug. 2, 332; ³*Arch. of Internal Med.* 1925, April, 433; ⁴*Jour. Amer. Med. Assoc.* 1924, Aug. 2, 326; ⁵Quoted by Crohn and Rosenberg (loc. cit.).

COLON, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

E. S. Judd and L. W. Pollock¹ report that 615 cases of diverticulitis have been observed at the Mayo Clinic. The great majority of these occurred in recent years since X-ray examinations of the colon have been more frequent. The mere presence of diverticula in the colon is not sufficient indication for operation. Unless symptoms directly due to the lesion are evident it may be ignored. Slight or transient inflammatory attacks also do not warrant intervention. The scarcity of serious results from incipient cases amply justifies a waiting policy. The disease is not inclined to be progressive. Of this series there were 137 cases which presented serious symptoms demanding surgical intervention. Analysis of these symptoms offers a clue to the diagnosis of this obscure condition.

The diverticula are usually, although not always, on the mesenteric border of the bowel, occurring at the points where the outer layers are perforated by the nutrient vessels. The result of this is that the perforations tend to be masked, and instead of general peritonitis we shall have walled-off abscesses in the mesentery. Pain was present in 80 per cent of cases, constipation in 60 per cent, and abdominal tenderness in 60 per cent. Gas and distention were noted in 30 per cent, and in 34 per cent one could palpate a tumour mass. This tumour mass always raises the question of carcinoma, and necessitated operation in several cases which would otherwise have been treated expectantly. The differential diagnosis from carcinoma is often impossible. Pain is of the same type. Bleeding occurs more frequently in cancer, but there are enough inflammatory cases that bleed to vitiate this point as a distinction. Rectal or sigmoidoscopic examinations are of little avail. The tumour is generally too high up to see by this means, and the bowel is fixed and angulated to such an extent that it is difficult or impossible to insert the speculum very far. The finding of other diverticula makes it likely that the condition is innocent, but again this is not a good criterion, as 14 per cent of the diverticulitis cases had undergone malignant degeneration. The persistent slight fever so generally present in diverticulitis is also not uncommon in cancer. Urinary symptoms are often quite prominent. Pressure or spread of infection to the bladder caused dysuria in 20 per cent of cases; 7 in the series had vesico-rectal fistulae.

The treatment of these inflammatory masses presents great difficulties. A few years ago immediate resection was advocated, but it soon became evident that this was utterly impractical on account of the enormous mortality. The walls of the colon are infiltrated and diseased almost to the extent seen in ulcerative colitis. These indurated walls are loaded with bacteria, and operative manipulation will stir up violent infections which often result fatally. Drainage of the large bowel at a distant point, with subsequent daily irrigations, is the operation of choice. Often, after such a preparation, excision of the tumour becomes a relatively safe procedure. C. H. Peck² calls attention to the fact that such an operation often brings about a complete cure without resection. There is also a tendency for these cases to clear up under appropriate medical management without any operation whatsoever. The reviewers had a case with a tumour as large as a child's head in a man who had such a severe myocardial decompensation that operation was out of the question. This abscess ruptured into the bowel, and complete recovery took place. A. Primrose³ also reports cases of massive tumours which disappeared after caecostomy and irrigations.

F. C. Herrick⁴ reports three cases of *hyperplastic tuberculosis of the caecum*, and has collected 67 in the literature since 1907. This condition is one which presents great difficulties in diagnosis even after the abdomen is opened, and therefore this analysis offers interesting data. The existence of tuberculosis elsewhere is not necessary; 29 cases had other lesions, and 35 had none. However, the low-grade intestinal obstruction in a number of instances afforded an obstacle to the recovery of relatively benign lung tuberculosis. The onset of the symptoms was sudden in about half the cases. A tumour mass was palpable in 5 cases. Pain was the commonest symptom, and this varied in character from a chronic dull ache to the acute colic of obstruction. The picture presented is apt to be confused with either appendicitis in the acute cases or with cancer in the chronic ones. The following list of symptoms shows how closely the picture resembles cancer: pain 38, colic 15, obstipation 1, diarrhoea 8, fever 10, anorexia 1, weakness 5, loss of weight 20, vomiting 20, blood in stools 5, constipation and diarrhoea alternately 8, tarry stool 1,

peritonitis 1, night sweats 3, constipation 14, nausea and vomiting 1, intestinal obstruction and fecal vomiting 1, tumour 7.

It will be seen, however, that tuberculosis is much less likely to bleed, and evidences of inflammation are more common. The age incidence averaged 30, a little younger than cancer but not enough so to help much in most cases. One differential point that has some value is the fact that these tuberculomas often grow to quite a large size without becoming fixed to the extent that a cancer would. The treatment depends on many factors. Simple laparotomy is followed by a considerable number of cures, in the same manner as this occurs after opening cases of tuberculous peritonitis. This fact makes one incline to conservatism, and to avoid resections or radical operations in difficult cases or those in which the patient is a poor surgical risk. Anastomosis also will cure many. However, if conditions are favourable, resection is the method of choice; but it must be remembered that mortality is high, and it should not be undertaken in cases which offer great technical difficulty, as a less risky operation will generally bring about improvement if not cure.

Lecène⁵ describes three cases of *megacolon* involving the sigmoid which closely simulated appendicitis. This chronic dilatation of the sigmoid is much more common than general megacolon. Symptoms arise when the long loop undergoes torsion and volvulus occurs. The offending loop is more apt to lie on the right than on the left side. Sudden pain then appears in the right lower quadrant, accompanied by nausea and vomiting and all the usual signs of appendicitis. The onset, however, of signs of infection, leucocytosis, and fever is later than in true appendicitis. Tenderness is present, but it is not sharply localized, and is generally present to a less degree on the left side as well. This picture should suggest caution. A radiological examination will settle the matter. If megacolon is present, the preliminary administration of a purge will render the operation much safer and easier. Resection of the dilated loop, preferably with preliminary exteriorization, is the operation of choice. One of the resected specimens held 3½ litres.

Cancer of the colon, according to J. Homans,⁶ offers a better prognosis for surgery than almost any other internal malignancy. Almost every case presents a history of slowly increasing obstruction, pain, and bleeding, and the majority of such cases can be diagnosed in time to permit of radical removal. Another factor is the relatively low grade of malignancy of most bowel tumours. A rather high percentage die with the cancer tissue confined to the colon. The symptoms of growths on the right and left side vary considerably on account of the physiological conditions. On the right side the tumours are more often of the proliferative cellular type. Obstruction is not seen so early. Local pain, bleeding, and symptoms of infection from breaking down are more the rule. The disease is often mistaken for appendicitis. In the descending colon the contents are dehydrated and hard, favouring the early onset of ileus. Besides, the tumours are more often of the scirrhous type, causing contraction of the tissues with blocking of the lumen of the bowel; this sort are not so inclined to bleed. Homans expresses the main factor in the diagnosis of these lesions as follows: "It is not difficult to make a diagnosis once cancer is suspected. The difficulty lies in making ourselves suspect it." It is the early recognition of the premonitory symptoms that is important. Any middle-aged individual with a mild gastro-intestinal disturbance of long duration deserves special study to rule out cancer of the colon. The pain is vague. Cramps at irregular periods, especially when constipated, are a danger sign. If we can only learn to suspect cancer in this type of case, the opaque enema offers a very certain method of diagnosis.

Articles by Schwartz,⁷ C. H. Peck,⁸ and C. H. Mayo and W. Walters⁹ describe

the surgical removal of these tumours, and are quite agreed on the best technique. Cancers of the right colon are suited to one-stage operations, and may be removed at the first sitting in most cases, unless the condition of the patient is very bad owing to neglected acute obstruction. In the left half of the colon these operations have been far from satisfactory. Leakage and giving way of suture lines in bowels which have been subjected to long-continued pressure from partial obstruction have caused a very high mortality. Preliminary drainage by a cæcostomy is one very good method of preparation, which renders the operative risk much less. Much better, however, is the two-stage Mikulicz operation—preliminary exteriorization of the cancerous loop, with subsequent removal. By this means all danger of peritonitis is avoided. The leakage of fecal material does not begin until the peritoneum is sealed off. After the restoration of the fecal current by means of sloughing a hole through the dividing loop with a clamp, the wound can often be closed without any further major operation. Generally the closure demands a real operation, but this is never very difficult.

F. W. Rankin¹⁰ speaks less favourably of this method, and enumerates quite a series of drawbacks which go to show that this type of operation cannot be said to offer an ideal method by any means.

REFERENCES.—¹*Ann. of Surg.* 1924, Sept., 425; ²*Ibid.* 1925, Jan., 322; ³*Surg. Gynecol. and Obst.* 1924, June, 825; ⁴*Ann. of Surg.* 1925, April, 801; ⁵*Bull. et Mém. de la Soc. Nat. de Chir.* 1925, May 23, 522; ⁶*Boston Med. and Surg. Jour.* 1925, April 9, 695; ⁷*Bull. et Mém. de la Soc. Nat. de Chir.* 1924, 1, 462; ⁸*Ann. of Surg.* 1924, Sept., 450; ⁹*Surg. Gynecol. and Obst.* 1924, July, 1; ¹⁰*Jour. Amer. Med. Assoc.* 1924, July 12, 86.

CONGENITAL HEART DISEASE. (See HEART, CONGENITAL MALFORMATION OF.)

CONJUNCTIVA, DISEASES OF. *Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)*

Roseola of the Conjunctiva: a Subacute Exanthematous Conjunctivitis peculiar to Secondary Syphilis.—S. Morse¹ says that conjunctivitis is well known in exanthematous diseases, such as measles, small-pox, typhus, and scarlet fever, usually preceding the skin manifestations. It is a form of hyperæmic conjunctivitis, which he believes to differ from the ordinary form of conjunctivitis, in which the conjunctiva can be blanched by pressure or epinephrin. It is characterized by suddenness of onset, lack of discharge, some photophobia (not found in usual forms of conjunctivitis), and little or no lachrymation. The symptoms develop in a subacute or chronic manner, with an itching and sometimes burning sensation of the eyes. It is typically seen in early measles, and needs no further description. The point of his paper is, that whereas this condition has often been noticed in secondary syphilis as a by-product of the disease, not much attention has been paid to it as a suggestive symptom of syphilis. He has, however, seen cases, of which he describes three in his paper, who had been referred to him by reputable physicians, with the history that the inflamed eyes from which they suffered would not yield to the ordinary treatment for conjunctivitis. On investigation, they were all found to be suffering from syphilis, the Wassermann reaction being positive in each case, and all yielded promptly to specific treatment.

Occupational Kerato-conjunctivitis in Cinema Artistes.—Jean-Sédan² in an interesting article gives an excellent account of this condition, detailing two cases. The condition is caused by the strong electric light to which those taking part in the production of a film are exposed. It is very common, and large numbers may be affected at the same time. The author says corneal complications are uncommon, the conjunctiva only being usually affected. In some cases legal proceedings have been instituted as a result of these

cases, and damages obtained. The important point to remember is to advise these people to wear **Protective Glasses** containing a lead salt during the rehearsals, and to take them off for the actual performance which is photographed. Cases in which trouble has occurred have usually been exposed to glare during several rehearsals. [It appears, however, that an exposure of a few seconds may sometimes produce this condition. The affection is obviously similar to 'electric ophthalmia' in its severer form, and to 'snow blindness' in the milder form.—A. E. J. L.]

Angular Conjunctivitis.—A. D. Griffith,³ writing of the treatment of angular (or diplobacillary) conjunctivitis, mentions, as its characteristic feature, redness of the lid margin, usually at the inner angle. The redness spreads over the intermarginal margin on to the skin. Lid margins are moist, with a little scum on them; discharge watery, with a few flakes of fibrin. A slightly **Alkaline Lotion** is of great use in this and all forms of conjunctivitis for dissolving mucus and exposing a clean surface to the action of specific drugs. **Zinc** is a specific antiseptic in this condition. Zinc drops are often irritating, but the addition of **Rose Water**, which has some anæsthetic action, may enable the patient to tolerate them. **Cocaine**, of course, may be used in small quantities. He gives two useful formulæ :—

Alkaline lotion :

R	Sodii Chlor.	gr. iv	Aq. Camph.	℥xv
	Sodii Biborat.	gr. iij	Aq. Dest.	ad 3j
	Sodii Bicarb.	gr. ij		

The solution is double the strength at which it should be used, and should be diluted with an equal quantity of boiling water. The camphor keeps the solution sterile.

Zinc drops : They are usually employed in strength from $\frac{1}{2}$ gr. to 2 gr. in camphor-water. The following formula may suit a sensitive patient :—

R	Zinci Sulph.	gr. $\frac{1}{2}$	Aq. Rosæ	3j
	Sodii Sulph.	gr. ij	Aq. Dest.	ad 5ss
	Aq. Camph.	℥xv		

[The reviewer, in ordering zinc drops if at all strong, always tells the patient to take out a few drops into a clean spoon or other receiver, and to dilute them with an equal part of boiled water; then gradually increase the strength. If too strong they can regulate them to make them just 'sting' a little. It is desirable to work up as soon as possible to 2 gr. to the ounce in this condition, and this is a quick way of doing it, as the eye usually gets accustomed to the lotion after a short time. It also prevents the patient coming back, saying he cannot use the lotion.—A. E. J. L.]

Phlyctenular Conjunctivitis.—H. L. Savin and T. W. Preston,⁴ after studying a series of 50 cases, conclude that phlyctenular conjunctivitis is a disease of unknown etiology but predisposed to by tuberculous infection (not always present), enlarged tonsils and adenoids, frequent colds, overcrowding, dirt, and malnutrition. There seems to be reasonable ground for attributing the cause to endogenous toxæmia. Treatment found most effective was **Fresh Air**, frequent **Bathing**, and the application of 2 per cent **Yellow Oxide of Mercury Ointment**. In cases of keratitis, **Atropine** is often necessary. [Useful as new forms of treatment may be, it is cheering to find the authors still support a time-honoured treatment. The late Professor C. von Hess preferred the use of 2 per cent **Silver Nitrate** in this condition.—A. E. J. L.]

P. A. Harry⁵ has treated phlyctenular conjunctivitis (scrofulous ophthalmia) during the last two years by injections of **Sodium Morrhuate**. This is the sodium salt of the fatty acids of cod-liver oil. One c.c. of a 3 per cent solution

(Allen and Hanburys' ampoules) was injected subcutaneously, twice or thrice weekly. By this method combined with general treatment a rapid cure resulted. Many of the cases in previous attacks had had other forms of treatment, which failed to produce a speedy cure or to prevent recurrences.

Ophthalmia Neonatorum.—A very valuable demonstration of the methods used in treating ophthalmia neonatorum in St. Margaret's Hospital, London, was given to members of the Convention of English-speaking Ophthalmologists held in July, 1925, by Mr. M. S. Mayou. This hospital was established by the Metropolitan Asylums Board, at the request of the Ministry of Health, in 1918. The following points struck the writer as of interest. A child is always admitted with its mother to allow of breast feeding, if this is possible, and the treatment of the mother. If this is not possible, the child requires special care, and it has been found by experience that perhaps the most valuable means of preventing disease developing in such children is to keep the child in an open-air ward, where it gets as much sunlight as possible. This makes a very marked difference we were told. It should be noted that there are two open-air wards, and that as far as is possible all cases are given as much fresh air and sunlight as possible, as an essential part of the treatment. In an ordinary case the eyes are irrigated with a solution of *Eusol* of the strength of 1-10. The formula for making the solution is: Calx chlorinata 210 gr., boric acid 210 gr., water 1 pint; shake. Add 1 pint of this solution to 10 pints of water; stand for 12 hours, and then filter.

The eyes are irrigated with this solution every hour in bad cases, every two hours in moderately severe cases, and every three hours in mild cases.

After irrigation, a drop of solution of *Acriflavine* in *Castor Oil*, of the strength of 1-1500, is instilled into each eye. The formula for making this solution is: *Acriflavine* paint 3 gr., absolute alcohol 3 drachms, castor oil 1 pint. This acts as an antiseptic retarding the growth of micro-organisms, and the oil prevents the lids from sticking together. Mayou said that every year children were admitted in whom the sight had been totally destroyed or damaged by the instillation of *Silver Nitrate* solution or strong solutions of *Perchloride of Mercury*. The midwife happens to have perchloride in her bag, and uses it in too strong a solution. Silver nitrate should only be used as a prophylactic in cases in which it is known that gonococci were present in the vagina of the mother before birth. After the first week, *Protargol*, 10 per cent, or silver

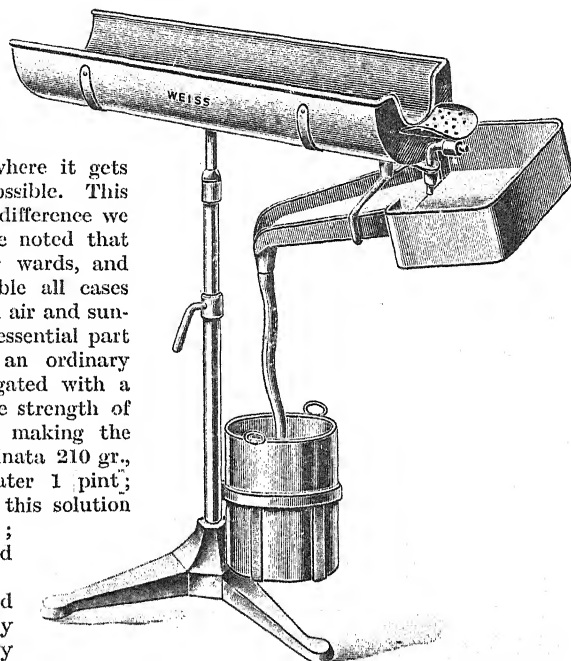


Fig. 6.—Trough table for prophylactic irrigation for ophthalmia neonatorum. (Kindly lent by Messrs. John Weiss & Son Ltd.)

nitrate, 10 gr. to the ounce, is used once a day, in addition to the irrigation. The child is placed in a trough-table with a rest for the head, in which it is easily held (*Fig. 6*). The solution is contained in a vessel two feet above the child's head. One nurse controls the child whilst the other carries out the irrigation. Protective glasses and gloves are always worn. Mayou insists that proper treatment can only be carried out in a hospital or similar institution, and no one who has any experience of these cases will fail to agree with him. Regular treatment cannot be ensured otherwise. [I am much indebted to Mr. Mayou for his help in preparing this note.—A. E. J. L.]

What is 'Swimming-bath Conjunctivitis'?—R. Paderstein⁶ says that the personnel of the bathing establishments of Berlin are of the opinion that it is due to infection by bathers suffering from gonorrhoea! This explanation has doubtless crossed the minds of others who have thought about the matter. He says, however, that the evidence does not support this view. Gonococci are not found in these cases. Some relation, however, between these diseases cannot be entirely excluded. He is not convinced that any treatment can influence the course of this disease, which is entirely favourable. [Should anyone wish to study further the possible connection between swimming-bath conjunctivitis, inclusion blennorrhoea, and trachoma, he will find the matter fully discussed by E. Engelking in the *Klinische Monatsblatt für Augenheilkunde* for 1925, p. 622.—A. E. J. L.]

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, April 25, 1256; ²*Ann. d'Oculist.* 1925, Jan., 42; ³*Clinical Jour.* 1925, March, 127; ⁴*Lancet*, 1925, i, 965; ⁵*Prescriber*, 1924, Nov., 377; ⁶*Klin. Monats. f. Augenheilk.* 1925, 634.

CORNEA, DISEASES OF.

Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)

Mooren's Ulcer of the Cornea (Ulcus Rodens).—Nida¹ advises, as the result of his experience of many methods of treating this condition, which he describes as 'a terrible one': (1) Removal of the infiltrated zone as delicately as possible, taking care to pass well beyond the limits of this zone. This step is insisted on as being most important in causing the conjunctiva to adhere to the cornea. (2) The ulcer itself is then **Cauterized**. (3) The cornea is covered with a conjunctival flap. This method has been successful in the hands of Morax and others, as in his own, but he admits it often fails even in cases that appeared favourable. It is, however, the method that offers the best chance of success.

Thier² points out the seriousness of the prognosis in Mooren's ulcer, which not infrequently turns the cornea into a cicatricial mass, thus reducing the vision to mere perception of light. He describes a case in which one eye had become blind after treatment for such an ulcer. As the patient stayed away for eight days after the treatment of the ulcer with tincture of iodine and the conjunctiva with silver nitrate, the treatment in this particular case cannot be said to have been thorough; but it is obvious that a severe type of ulcer was present. An ulcer started in the other eye. Prompt cauterization caused a short apparent arrest, followed by rapid advance of the ulcer. The eye was then first treated with 5 per cent Protargol to get rid of discharge. Atropine locally and 'Aolan' intramuscularly were also given. The next day the **Bulbar Conjunctiva was Divided** at the limbus both above and below, and undermined freely as far as the fornices, both vertically and laterally, so as to relieve tension in the flaps. The undermining scissors were pushed through the conjunctiva at the fornices, and it was divided laterally to some extent to make the flaps as mobile as possible. The flaps were sewn together so as to cover the cornea and the globe completely. The eye was left open under a shield of wire netting, and occasionally freed from discharge. Two days after the operation the pain in the eye had ceased completely. The treatment led to the complete cure of the ulcer. The author has used this conjunctival

operation extensively in cases of severe ulceration and injury, with excellent results. [Only practitioners with special experience in eye work will deal with such cases in Europe, but those practising abroad are forced to do so. The operation described is not difficult to do, and has been used with great success by the reviewer in other forms of corneal ulcer and in cases of injury to the cornea. He would point out that, in addition to the ordinary treatment, appropriate doses of **Thyroid Gland**, in cases where no contra-indication to its use exists, sometimes has a favourable influence in this condition. Treatment is sometimes so unsatisfactory that both surgeon and patient alike are almost in despair. The reviewer once saw such a case, which had been treated elsewhere for some weeks. There was only a tiny piece of clear cornea left in the centre of the cornea. After trying other remedies, prompted by its use in other forms of corneal ulceration and infection, the ulcer was touched with $\frac{1}{2}$ per cent **Nitrate of Silver** solution, which was increased to 1 per cent, and then 2 per cent, on successive days. Great care was taken to avoid excess of silver nitrate on the swab, so that none ran down into the conjunctival sac, and thus to avoid pain and irritation. A swab moistened with normal salt solution may be placed in the lower fornix in some cases, as a precautionary measure. The eye is kept open for a time to prevent the dilution of the silver nitrate by the tears. A drop of 1 per cent **Holocene** solution is dropped in the eye if the patient complains of pain. This has the great advantage over cocaine of being antiseptic and of not damaging the corneal epithelium. The ulcer was completely cured after some time, and vision retained. Some months afterwards the other eye was similarly affected. The same treatment led to arrest of the ulcer.—A. E. J. L.]

Is Conical Cornea Hereditary?—O. Wolz,³ after an exhaustive survey of the literature, concludes that conical cornea is inheritable. He quotes a number of cases, and a study of them elicits the interesting fact that the degree of curvature of the cornea was most marked on the same side, in five of these groups. [It is well that practitioners should know of the results of this investigation, as some may have patients with conical cornea, and they may be asked this question. Also they should warn the patients, if they have children, of the necessity of having their eyes carefully watched and any error of refraction at once attended to.—A. E. J. L.]

REFERENCES.—¹*Ann. d'Oculist.* 1925, March, 178; ²*Arch. f. Augenheilk.* 1924, Feb. (abstr. *Brit. Jour. Ophthalmol.* 1924, 548); ³*Arch. f. Augenheilk.* 1923, March (abstr. *Brit. Jour. Ophthalmol.* 1924, Nov., 515).

CORONARY ARTERY DISEASE. (See also ANGINA PECTORIS; HEART, EXAMINATION OF—ELECTROCARDIOGRAPHY.)

J. E. MacIver, M.D.

S. B. Boyd Campbell, M.D.

In a report upon 13 cases of occlusion of the coronary artery, H. C. Gordinier¹ says that it is usually associated with other pathological changes in the first part of the aorta—syphilitic aortitis, arteriosclerosis, etc.—and presents a perfectly definite symptom-complex, namely:—

Pain: sudden excruciating anginoid pain, substernal (angina pectoris) or upper abdominal (angina abdominalis), with or without the characteristic radiation of true angina pectoris.

Facial expression of great anxiety. Colour pale to ashen gray, skin cold and clammy with sweat.

Pulse rapid and thready, often irregular (auricular fibrillation); sudden drop in systolic pressure.

Heart impulse a diffuse and feeble tap; the sounds are distant, and a gallop or tic-tac rhythm is often observed. Other forms of arrhythmias may often occur, such as ventricular tachycardia.

Pericardial friction, as shown by a strictly localized evanescent to-and-fro pericardial friction rub, is most characteristic.

Mild fever and a leucocytosis are also present.

Electrocardiographic changes are shown by alteration of the T wave in Leads 1 and 2, with sometimes arborization block, etc.

Four types of coronary occlusion are observed: (1) Cases, not at all rare, where death is very sudden, preceded or not by terrific substernal pain; (2) Cases with symptoms as described, death occurring in a few hours to a few days; (3) Cases in which death is due to myocardial insufficiency weeks or months after onset; (4) Cases with abrupt onset which eventually make a fairly good recovery, but with a diminished cardiac reserve.

F. A. Willius and G. E. Brown² give an analysis of 86 necropsies of coronary sclerosis.

ETIOLOGY.—As regards the incidence of the conditions they record: *Age*: youngest, 33 years; oldest, 81 years; average 60.3 years; 38 patients in the seventh decade, 4 cases in the fourth decade. *Sex*: 67 males, 78 per cent; 19 females, 22 per cent.

SYMPTOMS.—Twenty-one patients, or 24 per cent, had typical anginal attacks; 2, or 2 per cent, had atypical anginal attacks. Twenty-two patients, or 26 per cent, had the clinical syndrome of progressive myocardial failure, without painful attacks. Seven patients, or 8 per cent, had a combination of anginal attacks and progressive myocardial failure. Thirty-four patients, or 40 per cent, did not present sufficient subjective or objective evidence of cardiac disease to permit diagnosis of coronary disease—the occult coronary type.

MORBID ANATOMY.—The aorta was found to be normal in only one case. The heart valves were diseased in 44 cases (57 per cent), the valves being sclerotic and fibrous. The pulmonary artery was diseased in only 4 cases (5 per cent). The myocardium showed various degenerative changes in all the cases. The pericardium was diseased in 8 cases, or 9 per cent. Peripheral arteriosclerosis was present in 60 cases (70 per cent); renal arteriosclerosis in 32 cases (37 per cent); nephritis occurred in 46 patients, or 53 per cent. The degree of sclerosis was moderate in most cases. There was no instance of embolism. Atheroma was present in 90 per cent, syphilis in 9. The abdominal aorta was atheromatous in 21 per cent. The cardiac valves were sclerosed in 50 per cent; the aortic valves were most frequently attacked. Infarction of the myocardium occurred in 8 per cent. The gall-bladder was involved in 26 per cent. Hypertension occurred only in 31 per cent. Obesity was present in 29 per cent. Sudden death occurred in 37 per cent; this was most marked in the anginal cases.

A correlation of the clinical data and necropsy findings made by Willius³ led him to group the 86 cases just referred to into five classes: (1) Typical angina pectoris; (2) Atypical angina pectoris; (3) Progressive myocardial failure; (4) Angina pectoris and progressive myocardial failure; and (5) Occult coronary sclerosis. In 40 per cent of these cases the diagnosis of coronary sclerosis was not made by the clinician. In carefully reviewing the records of the patients it was found that there was insufficient subjective or objective evidence of heart disease to establish the diagnosis with the usual clinical methods of examination. As already noted, sudden death was most common in the typical angina cases. In order of frequency, the other clinical types of coronary sclerosis attended by sudden death were: occult coronary sclerosis, 21 per cent; angina pectoris with progressive myocardial failure, 10 per cent; progressive myocardial failure, 7 per cent; and atypical angina pectoris, 6 per cent. Death was the result of gradual cardiac failure in 11 per cent of the cases. Causes other than heart disease were responsible for death

in 48 per cent. In this study, of the patients receiving electrocardiographic examination, 68 per cent showed significant graphic abnormalities. In connection with these electrocardiograph records, the work of Pardee should also be studied (see HEART, EXAMINATION OF).

W. J. Kerr, S. V. Larkey, and A. E. Larsen¹ say that "the disease should be more frequently recognized than it is. Any male individual past 50 years of age (all 15 of our patients were male) who, with or without previous record of cardiac symptoms, presents a history of severe, agonizing, persisting pain in the chest or upper abdomen, accompanied by dyspnea, unrelieved by rest, should be considered a probable sufferer from coronary disease". They also point out the confusion of this condition with the "acute abdomen". They mention 8 cases recorded where the abdominal symptoms and findings masked the true condition. Various arrhythmias arise—e.g., heart-block, ventricular tachycardia, auricular fibrillation, and auricular flutter may occur. Electrocardiographic tracings may show variable degrees of block and alteration of the ventricular complex. X rays may show a heart of usual size or shape. As regards the clinical course, death may occur in a few hours or a few days. Patients may survive one or more attacks.

The authors have studied 15 cases where full clinical and pathological data were available. Eleven cases were over 40; 2 had suffered from subacute bacterial endocarditis; in 2 patients, 32 and 38 years of age respectively, no etiological factor was obtained, but both showed extensive arteriosclerosis. All 15 were males. Heredity seemed to play no rôle. In 4 cases there was a rheumatic history. One case had a positive Wassermann; a second showed luetic aortitis.

TREATMENT.—Long rest, mental and physical, is essential. Careful dieting. Digitalis in full doses at first, later small doses. Morphine is necessary for the pain. In the acute cases they suggest the use of Caffeine. Venesection where there is cyanosis, if the blood-pressure is not low.

L. T. Gager² considers that a functional type of hypotension due to transient factors, in the absence of other obvious cause, will commonly be due to myocardial insufficiency on the basis of coronary occlusion. Three cases are recorded. Digitalis was given in full doses to the second and third case. The clinical feature emphasized was severe cardiac pain, followed by hypotension, which he considers rests on the physiological basis of infarction and myocardial insufficiency following an occlusion.

J. M. Faulkner, H. C. Marble, and P. D. White³ report on the *differential diagnosis of coronary occlusion and of cholelithiasis*. They say that coronary occlusion is not necessarily fatal. They describe 3 cases with symptoms very like cholelithiasis, and give an analysis of 30 cases of coronary occlusion found at autopsy, as compared with those of 30 cases of cholelithiasis confirmed by operation. As regards sex, in the coronary group 24 were males and 6 females; in the other group 6 were males and 24 females. The average age in the coronary group was 58; in the other group 47.2. As regards the diagnosis on admission in the coronary group, in none was coronary sclerosis diagnosed, the diagnosis being cardiac disease (17), malignancy (5), cirrhosis of liver (1), arteriosclerosis (1), acute infection (1), no diagnosis (3). All these diagnoses except one were correct, the coronary occlusion being superimposed. The descending branch of the left coronary was occluded in 22 of the cases. The duration of the disease from onset of severe symptoms till death varied from an hour and a half to five years.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1924, Aug., 181; ²*Ibid.* 165; ³*Jour. Amer. Med. Assoc.* 1924, Oct. 11, 1199; ⁴*California and West. Med.* 1925, Jan., 46; ⁵*Jour. Amer. Med. Assoc.* 1925, June 6, 173; ⁶*Ibid.* 1924, Dec. 27, 2080.

CORONERS AND INQUESTS IN CRIMINAL CASES.

Joseph Priestley, B.A., M.D., D.P.H.

It is now definitely stated that the Government proposes to introduce a Bill dealing with coroners' inquests generally, but more particularly with regard to the inconvenience arising out of inquests which are, under present regulations and customs, held simultaneously with proceedings before magistrates for murder and manslaughter. The ordinary medical practitioners will welcome a change in the law, which will prevent the necessity for medical evidence being repeated oftener than is, apparently, wanted as the law now stands. It simply means an amendment of the 1887 Coroners Act on the lines of the recommendations of the Departmental Committee, issued 1909-10, and such other amendments as have been suggested from time to time.

CRANIAL SURGERY. (*See INTRACRANIAL SURGERY.*)DEAFNESS. (*See EAR, DISEASES OF.*)DELINQUENCY AND MENTAL DISORDER. *Henry Devine, M.D., F.R.C.P.*

W. Norwood East,¹ who has done much to stimulate psychiatric investigations in our prisons, contributes an interesting article on *exhibitionism*, based upon the study of 150 cases received for trial or on remand for this offence at Brixton Prison. Of these cases, 101 were classified as psychopathic and 49 as depraved. The former group includes psychoses, psychoneuroses, mental defectives, subnormals, visionaries, and alcoholics. It is pointed out that while the figures show that the majority of exhibitionists are psychopathic, punitive detention is in certain types the best mode of treatment. The largest group, the visionaries who derive sexual satisfaction from the exposure and accompanying gratification, are most easily cured by a term of imprisonment, and sometimes by a fine; by this means they are frequently made to appreciate the value of reality, and the vanity of phantasy formation. A similar method of dealing with the depraved group is generally the most to be recommended; but in the mixed psychopathic and depraved types the best course to recommend, if asked by the court, is often a matter of anxious consideration. With the psychotic and defective, treatment to be in any way beneficial must be carried out on other lines. The paper includes a number of interesting psychological observations, and the author quotes the pertinent observation of Putnam, who, in discussing the so-called 'insufficiently dressed dreams', says: "Such dreams show that we ought in the interests of human sympathy to recognize that between ourselves and those whom we stigmatize as exhibitionists, and therefore criminals, the difference, important as it is, is one of degree alone". In conclusion, medical men engaged in forensic psychiatry are advised to exercise their judgement as free from disgust as from compassion, lest the interests on the one hand of the individual, and the regard for public self-protection on the other, be obscured.

H. T. P. Young² has undertaken an investigation on the association of *mental defect or disease and incendiarism*. The motives of fire-raisers generally fall under the following heads: defrauding insurance companies; hiding evidence of guilt, e.g., in cases of theft; avoiding conviction and sentence to a military prison; to obtain shelter in prison on account of employment or destitution; revenge, hatred, anger, or fear; destitution; and nostalgia. Arson differs from other forms of wilful destruction of property in that in the former it is usually possible to elicit a plan of some sort, and in consequence it is rare for it to result from a chance impulse which is not resisted, whereas in the latter this is not uncommon. The writer does not deny that recurrent

impulses to set fire to property (pyromania) occur, but in none of his cases could the action be described as impulsive, and a comprehensible reason for it could usually be obtained. The mental states of the offenders examined in this series were as follows: mental deficiency, 5; subnormal, 7; mental instability, 4; manie-depressive, 2; chronic delusional insanity, 1; general paralysis, 1; dementia præcox, 2; paranoid dementia, 1; dementia, 1; mental enfeeblement, 2; normal, 18; total, 44.

W. Rees Thomas and Cecil Gostwyck³ make some observations on *delinquent mental defectives*, based upon their experience at the Rampton State Institution. This institution is devoted to the care of those defectives who are unfit for association with others, and who are not amenable to control in local institutions and homes. They have demonstrated their violent and criminal tendencies before admission, and have proved themselves antisocial characters. With few exceptions the patients belong to the higher grade of defectives, there being no idiots and but few imbeciles under care. The antisocial behaviour of the patients renders individual study essential, and a considerable proportion have superimposed on their defects a mental disorder of which the manifestation, sometimes slight and shadowy, sometimes obvious and severe, is usually recurring and transient. The cases may be classified clinically into three main groups: simple mental defectives; mental defectives with instability; mental defectives with psychoses. In the first group the defective capacity of the patients forces upon them an awareness of inferiority which tends to find compensation in an aggressive and antisocial attitude. In the second, although a satisfactory amount of reason, judgement, and wisdom is demonstrated by tests carried out under laboratory conditions, judged on the basis of behaviour, none of the faculties have been allowed to find expression in pro-social behaviour. Their irregular behaviour is due to variations in emotional tone. In the third, evidence is often found of the gradual development from childhood of a mental disorder which is found to have all the clinical characteristics of dementia præcox. Periodic outbursts of mental disorder occur, which do not differ from those in ordinary psychiatric practice.

In the debate in the House of Lords on Lord Darling's Criminal Responsibility (Trials) Bill, discussion centred very largely round the proposal to introduce into the law the proposition that, if a person suffers from mental disease which gives rise to an uncontrollable impulse, under which impulse he acts, then notwithstanding that he knows what he is doing, and notwithstanding that he knows the moral quality of his act, he is to be absolved. Lord Sumner, who moved the rejection of the Bill, stressed especially the view that if the bill were passed the protection against crime which has often turned the scale in many cases, and enabled a man to resist the impulse to crime, would be removed. He believed that certain criminals were deterred both by the certainty of punishment and the fact that it is speedy, and that it would be a mistake to remove from irresponsible beings that outside pressure which is at present exercised by the knowledge that if they fail to control what they ought to control they may find themselves punished by the law. E. Wittermann⁴ takes a somewhat similar view in writing on *the judgement of criminal responsibility in psychopaths*. He points out that the question as to whether and under what circumstances psychopathic states of degeneration must be regarded as insanity in the legal sense is one of great importance. He considers that the attitude taken towards this subject by the psychiatrist has a widespread social effect upon the degree to which psychopathic subjects exercise their self-control; he shows from statistics that when they could easily escape from consequences by pleading insanity, with the hope of an early discharge from

an asylum, a large number of cases either shammed or produced unconsciously states of amnesia, confusion, or delusions, which cleared up speedily when punishment was escaped. He expresses the view, furthermore, that certain medical experts, by leading questions and emphasis on certain aspects of morbid mentality, even fostered these in the criminally disposed class. On the other hand, since his own assumption of a more rigid criterion of insanity, these psychopaths have come to realize that they will have to pay the penalty for their lack of control, and have to a great extent adapted their conduct to this situation, so that the psychiatrist has exercised an influence on society and helped in educating such psychopaths to increased self-control. He points out that psychiatry should not serve as a cloak for asocial conduct, but should cultivate a sense of responsibility in humanity.

V. V. Anderson⁵ writes a useful paper on the *psychiatric clinic in the treatment of conduct disorders of children and the prevention of juvenile delinquency*. The Commonwealth Fund of New York City has embarked on a stupendous five-year programme in the prevention of delinquency—quite the most noteworthy and far-reaching attempt ever made to weed out potential crime and juvenile delinquency. With the assistance of a number of committees, including the National Committee for Mental Hygiene, it is demonstrating by means of three clinics, two of which are travelling, that conduct disorders in children can be corrected and prevented by the proper and timely utilization of psychiatric assistance. The first clinic was held in St. Louis over a six months' period in 1922. Thorough and detailed psychiatric, physical, social, educational, and psychological studies were made on 300 cases of conduct disorder, the ages ranging from three to twenty. A number of interesting findings are reported. Thus, contrary to the common idea, psychopathic personality was found to be three times as prevalent as mental defect. Probably most psychiatrists of experience would be inclined to feel that the psychopathic personality is not only more difficult to deal with than the mental defective, but a greater menace to society and to his domestic circle.

REFERENCES.—¹*Lancet*, 1924, ii, 370; ²*Ibid.* 1925, i, 1334; ³*Jour. Ment. Sci.* 1925, July, 41; ⁴*Münch. med. Woch.* 1924, Oct. 3, 1397; ⁵*Jour. of Crim. Law and Crim.* 1923, xiv, 414.

DEMENTIA PARALYTICA.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

In recent years, the **Pyrexial Treatment** of general paralysis, originally suggested by Wagner von Jauregg, has become increasingly popular. Artificial pyrexia has been induced by the injection of various substances, including **Tuberculin**, **Sodium Nucleinate** and its congener **Phlogetan**, and also of blood containing the virus of benign tertian Malaria or of Relapsing Fever. Of these, the most convenient has proved to be malaria. Patients with general paralysis treated by malarial inoculation have undoubtedly, in a considerable proportion of cases, shown remissions of the malady, though it has yet to be demonstrated that any case, treated by malaria alone, has become permanently cured, as controlled by examination of the blood and cerebrospinal fluid.

Malarial inoculation is generally carried out direct from one patient to another. The blood from one general paralytic in the stage of malarial infection is inoculated into another patient by either intramuscular or intravenous injection. Where direct inoculation from one patient to another is not available, the malarial blood, suitably defibrinized, can be sent from one part of the country to another in a vacuum-flask packed in ice, and still remains active for inoculation purposes. Recently the Ministry of Health in London with remarkable enterprise has arranged for the providing of teams of infected

mosquitoes which can be sent out to bite any desired patient. These mosquitoes, of course, are confined within a gauze cage, so that their biting shall be strictly limited to the patient and not be permitted to attack other individuals. After an incubation period of two or three days in intravenous inoculation, of six to ten days or thereabouts in intramuscular inoculation, and of twelve days or so in the case of mosquito infection, malarial fever sets in, and, after two or three days of irregular pyrexia, settles down to the typical sharp-swinging temperature of tertian malaria. Most cases, in the reviewer's experience, tend to show a double tertian infection, i.e., an attack of fever daily instead of on alternate days. This occurred even in the mosquito-infected patients under his observation. After six, eight, or ten attacks of sharp pyrexia, depending on the patient's general condition and especially on the strength of his cardiac muscle, the malaria is promptly brought to an end by moderate doses of quinine; 15 gr. daily is usually enough, and this is persevered with for a week or two. The results of malarial treatment in general paralysis were discussed in last year's *MEDICAL ANNUAL*, and need not here be recapitulated. Clinical remissions have undoubtedly been induced in a considerable proportion of cases. But, of course, it must be borne in mind that pyrexial treatment of this, the most dangerous form of neurosyphilis, is not specific for the spirochætal infection. If we are really to cure the syphilis, we must have a true antispecific remedy. The ideal treatment, of course, would be an Antisyphilitic Serum produced by inoculation of some other animal. There is said to have been some work in this direction carried out by observers in South America, who have treated syphilis by using a serum obtained from the llama, which appears to be susceptible to syphilis.

In 1919 Jacobs and Heidelberger,¹ of the Rockefeller Institute, produced a new arsenical preparation, known as Tryparsamide (N-phenyl-glycinamide-para-arsenic acid), which has been suggested as specially efficient in the treatment of neurosyphilis in general and of general paralysis in particular. This drug was not issued to the general medical public in the first instance, but was first carefully tried clinically by Lorenz, Loevenhart, Bleckwenn, and Hodges,² and subsequently by Moore, Robinson, and Keidel,³ special attention being given to the risk of its toxic action upon the optic nerves, a danger foreshadowed by Louise Pearce⁴ in her use of the drug in the treatment of South African sleeping sickness.

Tryparsamide is a white crystalline powder, readily soluble in distilled water, and suitable for intravenous or intramuscular administration in 33.3 per cent aqueous solution. The average intravenous dose is 2 to 3 grm. given once a week for eight successive weeks. The drug contains a high proportion of arsenic—no less than 24.57 per cent. There is, however, one serious drawback to its regular employment. Like atoxyl, it appears to have a special liability to induce optic atrophy. It must be remembered that tryparsamide, whilst it is a powerful trypanocide, has relatively little direct spirillicidal action. It is therefore quite unsuitable for the treatment of early syphilis, or, in fact, of syphilis in general, where a spirillicidal action is desired. Therefore in the treatment of primary or secondary syphilis it has no place. Nor is it adapted for the treatment of early neurosyphilis, for it neglects the syphilis, as it were, by its lack of direct action on the syphilitic organisms. It acts by stimulating resistance and the defensive mechanism. It has a remarkable power of penetration of the central nervous system, being markedly superior in this respect to the familiar salvarsan or neosalvarsan.

A sufficient number of carefully controlled observations have been accumulated to give us an idea as to the value of tryparsamide, and the drug has now been released by the Rockefeller Institute for general use, with due

warning as to its drawbacks and dangers. Lorenz, Loevenhart, Reitz, and Eck⁵ treated 185 cases of neurosyphilis, including 90 cases of ordinary G.P.I., 23 cases of early or asymptomatic G.P.I., 29 cases of meningovascular syphilis, 14 cases of tabo-paralysis, and 29 cases of tabes; 3 gm. of tryparsamide weekly for eight successive weeks constituted a course; midway between the tryparsamide injections, mercury salicylate was given intramuscularly in weekly doses of $\frac{1}{2}$ to 1 gr. This treatment benefited many of the cases of general paralysis and of meningo-vascular syphilis, but was less effective in the tabetic and tabo-paralytic cases. Of the general paralytics, 41 per cent were said to be restored mentally and 42 per cent improved. Both in the paralytic and meningo-vascular groups the Wassermann reaction of the blood became negative in just under 50 per cent. The cerebrospinal fluid also improved in a striking manner; the earliest improvement was the disappearance of the lymphocytosis, which they claim is reduced to normal in all cases by the end of the third course of treatment; next the colloidal-benzoin reaction lost its syphilitic characters, and last of all the colloidal-gold reaction returned to normal. The occurrence of visual disturbance during treatment was looked for: 13 cases developed optic atrophy with amblyopia; of these, 10 were tabetics or tabo-paretics. It was found that, by withholding the tryparsamide for a month and subsequently recommencing with smaller doses, the amblyopia disappeared and the full course of treatment could be completed.

Moore, Robinson, and Lyman⁶ record the results of treatment in 133 cases of neurosyphilis, and claim that the clinical and serological results in neurosyphilis surpass those obtained by any other form of treatment. Tryparsamide is of special value in early general paralysis, in meningovascular syphilis, and in the majority of cases of tabes. Advanced G.P.I. is benefited little, if at all, whilst in early neurosyphilis the comparatively feeble spirochaetocidal action of this drug precludes its use unless in combination with salvarsan. Visual disturbances occurred in 17.8 per cent of a series of 241 cases, but in only 2.8 per cent were the changes permanent.

Stokes and Wilhelm⁷ record a series of 152 patients, 49 of whom were cases of G.P.I. in the Rochester State Hospital for the Insane, and 112 were patients attending the Mayo Clinic. The Mayo Clinic cases included cases of general paralysis, asymptomatic G.P.I., tabes dorsalis, heredo-neurosyphilis, together with 5 cases of disseminated sclerosis and one of erythema induratum. So far as the results of their eighteen months' experience go, they find the clinical results much more striking than the serological; but the latter undoubtedly are present, and may be improved on with time and the development of new and better treatment combinations. Tryparsamide treatment they consider superior to other forms of treatment for neurosyphilis on the score of minimal expense, inconvenience, and loss of time, and maximal symptomatic gain in mental cases. Eye complications, however, constitute a definite risk, of which patient and physician should be fully aware. Therefore a competent ophthalmological examination of the eyes should precede the first administration of the drug, and should be repeated several times, especially during the first injections of the first course, when complications seem most liable to arise. Visual acuity and the perimetric fields must be accurately recorded. Subjective symptoms such as dimming or blurring of vision, flashes or clouds of light, or a sense of greyiness in the vision, are signals for immediate testing for objective damage and for the discontinuance, for a time at least, of the tryparsamide. The results in advanced G.P.I. are disappointing and do not encourage its continuation. In resistant cases of tabes it appears to have a beneficial effect, even where the cerebrospinal fluid is negative. Much emphasis should be laid on the fact that the drug is not intended for, or adapted

to, the ordinary treatment of syphilis, and especially of early syphilis, owing to its lack of spirochætidocidal power. Schwab and Cady⁸ studied its effects in 97 cases of neurosyphilis, the majority of which were examples of tabes or G.P.I. A serological improvement was obtained in 93 per cent of the general paralytics and in practically all the other types of neurosyphilis. In 85 per cent there was a noted clinical improvement. In 27 per cent visual disturbances occurred, usually in the form of dimness of vision; and in two cases with involvement of the optic nerve, complete blindness resulted. These workers conclude that, when combined with salvarsan and mercury, tryparsamide offers a more hopeful prospect in neurosyphilis at the present time than any other drug or combination of drugs. Kennedy and Davis,⁹ from a study of 31 cases of neurosyphilis of various types, are satisfied that the therapeutic results obtained with this drug compare favourably with other forms of treatment, although they admit the risks of injury to the optic nerve are greater.

In this country Dawson¹⁰ treated 20 cases of G.P.I. and tabes at the Maudsley Hospital; in 15 of these a second course was given, and in one case a third course. The blood and cerebrospinal fluid were systematically observed in every instance; but Dawson, whilst recording a definite clinical improvement in 13 cases out of 20 and a serological improvement in 7 cases out of 20, had 2 patients who died. In no case in his series was any remarkable result produced such as might not possibly have been obtained by the administration of other arsenic compounds. Whether tryparsamide is really more potent than other arsenicals is not proved in Dawson's series of cases, but the drug is certainly worthy of further trial.

REFERENCES.—¹*Jour. of Exper. Med.* 1919, 411; ²*Jour. Amer. Med. Assoc.* 1923, May 26, 1497; ³*Ibid.* 1924, Feb. 16, 528; ⁴*Jour. of Exper. Med.* 1921, Supplement 1, 1; ⁵*Amer. Jour. Med. Sci.* 1924, Aug., 157; ⁶*Jour. Amer. Med. Assoc.* 1924, 889; ⁷*Arch. of Dermatol. and Syph.* 1925, May, 579; ⁸*Arch. of Neurol. and Psychiat.* 1925, 80; ⁹*Ibid.* 1925, 86; ¹⁰*Lancet*, 1925, i, 1072.

DENGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

J. F. Siler, M. W. Hall, and A. P. Hitchens¹ record important experimental work in Manila on the transmission of dengue fever, using bred mosquitoes and recently arrived or otherwise immune subjects, confined over more than the full incubation period in a mosquito-proof room before experimentation. Forty-two American soldiers were subjected to 83 biting experiments, and dengue was transmitted by mosquito bites in 25 of them. These careful tests confirm the work of Cleland and Bradley in Australia in 1916 in proving conclusively that the infection is carried by *Aedes aegypti* (*Stegomyia fasciata*) with 60 per cent of successes, while *Culex quinquefasciatus* failed to infect any of a number of subjects subsequently proved to be non-immune. The dengue patients were capable of infecting the carriers during the first three days of dengue fever, but the insects did not become infective to man until the lapse of eleven days or more after being fed; they continued infective, however, for the rest of their lives, up to sixty-six days in one instance. Twelve persons who had suffered from dengue from 41 to 121 days previously were reinfected by injection into them of blood of early dengue cases, but 58 per cent of such persons were immune, while those attacked were sick for an average of only 2.8 days against 4.8 days in primary attacks, showing some degree of immunity after the previous dengue. The clinical resemblance between dengue and very mild yellow fever is marked, and both are conveyed by the same mosquito, indicating common etiological factors, and further investigations on similar lines are suggested.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1925, April 18, 1163.

DERMATITIS EXFOLIATIVA NEONATORUM.*E. Graham Little, M.P., M.D., F.R.C.P.*

J. E. Fisher and S. S. Wittenberg¹ report a new case of this disease, which is sufficiently rare to make it desirable that all fresh cases should be noted. The patient was a male infant, born without any abnormal circumstances, who developed, six days after birth, a number of bullæ on the hands. The temperature remained under 100° for the next two days, but the eruption rapidly spread, so that large areas of the body had the appearance of being scalded. The child died three days later, the temperature at the last rising to 102°. The mucous membrane remained unaffected throughout; smears from bullæ showed a short-chained streptococcus.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Sept., 289.

DERMATOSES, OCCUPATIONAL. *E. Graham Little, M.P., M.D., F.R.C.P.*

Bread-making.—R. Prosser White¹ has investigated experimentally the question of the responsibility of the various processes used in bread-making for the eruptions which are common in bakers. The materials handled by the baker are water, salt, flour, yeast, and certain so-called activators. All these have from time to time been regarded as the chief cause. The author and his assistants tested (upon their own skins) the effect of the ingredients used, applied under dressings of jaconet, and worn for several hours. The author comes to the definite conclusion, as a result of these personal experiments, that the irritative effect of the ingredients used in baking has been greatly exaggerated, and that many of the cases ascribed to baking are, in reality, not due to this occupation; and that the proportion of skin diseases amongst bakers is no higher than in the general population.

In another paper R. Prosser White² considers the part played by sensitization in industrial dermatoses, and comes to the conclusion that it is of very minor significance. Indeed, he regards the "number of sensitizations as being negligible in comparison with the number of chemical substances handled". With the removal of the irritant, most of the cases get well. As a corollary of these remarks he finds that desensitization is rarely possible.

Rubber Manufacture.—H. J. Cronin³ reports an epidemic in sixty employees in a rubber factory, in whom acute dermatitis of the exposed surfaces is the principal symptom. The active agent was presumed to be *hexamethylenamine*, which is used in the vulcanization of rubber. Removal of this ingredient prevented further cases developing. No methods were completely satisfactory in preventing the dermatitis until this substance was eliminated from the manufactory.

Lime Dermatitis.—W. J. O'Donovan⁴ usefully draws attention to the increasing frequency of lime dermatitis with the increasing use of cement. Frequently the occupation of the patient may give no immediate indication of contact with this irritant, e.g., men working in underground tunnels are a frequent class of sufferers; and persons using chloride of lime for bleaching purposes may show this reaction. The types of dermatitis that may be seen are vesicular eruptions or cheiropompholyx, seborrhæic eczema, exfoliative dermatitis, intertrigo, erythrodermia, pustular follicular dermatitis, and septal perforation. Over-sweating or abnormal dryness of the skin are predisposing factors. Preventive measures consist in frequent changes of all dust-laden underclothing, alteration of employment to lime-free work, and the nightly application of emollient grease to the skin of the face, hands, and forearms.

Hop Dermatitis.—Dermatitis from contact with hops would seem to be a very rare condition, if the absence of its mention in literature may be taken as evidence. W. J. O'Donovan⁵ describes two cases, the first in a girl of 20,

in whom swelling of the face occurred immediately upon arrival in the hopfield, so that she was obliged to cease work at the end of the day. Her face was red and swollen; eyelids oedematous; the affected skin covered with vesicles. The second case was in a girl of 16. The eruption appeared the day after visiting the hopfield. The symptoms were exactly similar to the previous case. The condition subsided rapidly under treatment, which is not specified.

Butyn Dermatitis.—The use of this new derivative of cocaine appears to be sometimes attended by the occurrence of eruptions. A. M. Greenwood and J. F. Quest⁶ report such a case in the person of a doctor using this drug as a local anæsthetic in passing sounds. The symptoms were severe, and included at different periods of the recurrent eruptions, swelling of the hands, arms, face, and genitals. The diagnosis was not arrived at until after several attacks, and the etiology was established by producing a similar eruption in the patient upon application to the skin of a butyn preparation of the same strength as that used by him in his work. The best formula for relief of symptoms was found to be: zinc oxide, 8 gm.; calamine, 4 gm.; phenol (carbolic acid), 2 gm.; glycerin, 4 c.c.; and water, sufficient to make 250 c.c.

REFERENCES.—¹*Med. Press*, 1924, ii, 368; ²*Ibid.* 1925, i, 477; ³*Jour. Amer. Med. Assoc.* 1924, ii, 250; ⁴*Lancet*, 1925, i, 599; ⁵*Ibid.* 1924, ii, 597; ⁶*Jour. Amer. Med. Assoc.* 1924, ii, 1077.

DIABETES. (See also EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

Hugh MacLean, D.Sc., M.D., Ch.B.

Diet.—The question of diet in diabetes still continues to be the source of much discussion, for the important fact is now universally recognized that, even when insulin is used, careful attention to diet is as important as ever; indeed, when a patient who is suffering from severe diabetes trusts too much to the effect of insulin and eats excessive amounts of food, it is not unusual for coma to supervene even when insulin is being regularly administered. The general idea, so prevalent in some quarters, that the use of insulin allows the patient to eat whatever kind and amount of food he chooses, has done much harm, and it cannot be too strongly emphasized that the administration of insulin without a carefully correlated diet may do no good and is not without dangers of its own. In treating any severe case of diabetes the ideal to be attained is freedom from sugar and acetone bodies in the urine, and a normal blood-sugar value. The greater part of the recent work on diet in diabetes concerns itself with the problem as to the best means to obtain this ideal result, and deals particularly with the problem of the prevention of acidosis. It is common experience that glycosuria can generally be eliminated in the diabetic by substituting protein and fat for the carbohydrate of the diet; but, in many cases, the disappearance of glycosuria is accompanied by an intense excretion of ketone bodies and a considerable acidosis. In such cases it may often be a doubtful point whether the patient was not better off on a diet that produced glycosuria than on a much stricter one that produced acidosis.

In an interesting paper, R. M. Wilder¹ discusses fully the question of *optima diets in diabetes*. In order to understand the present position it is necessary to refer shortly to what our views were a few years ago. For a long time it was held by physiologists that fat could only be oxidized in the body when sugar was oxidized as well, a view which was somewhat effectively expressed by the statement that "fat can only burn in the fire of carbohydrate". Now the greater part of the ketone bodies (acetone, diacetic acid, and oxybutyric acid) originate from the metabolized fat, though a certain amount is produced from protein. In 1921 Shaffer found that when sugar was acted on *in vitro* by hydrogen peroxide, the oxidation that took place resulted in the removal

of aceto-acetic acid if the latter was present in the solution. Starting from this purely test-tube experiment, he carried out observations on diabetic patients, and came to the conclusion that ketosis, or the presence of acetone and aceto-acetic acid in the urine, could only be avoided when certain definite relationships existed between the total fat content and the total carbohydrate content of the diet. Further, Shaffer considered that each molecule of fat required the presence of a molecule of sugar for complete oxidation. If, for the sake of simplicity, we take fat as represented by the chemical body stearic acid, $C_{18}H_{36}O_2$, it required one molecule of sugar, $C_6H_{12}O_6$, to oxidize this. The molecular weight of stearic acid from the above formula is 284, and the molecular weight of glucose 180; it therefore followed that 284 parts by weight of fat would require 180 parts by weight of sugar in order to undergo complete oxidation in the body. In other words, the ratio of fat to glucose by weight in the diet should be roughly 1.5:1. After this statement many observers fed their diabetic patients on diets containing this definite ratio of fat to carbohydrate, but it was found that much more fat than the amount allowed according to the above formula could frequently be given without producing ketosis. As the result of much experimental work, Wilder² and his colleagues later on put forward the view that one molecule of glucose could oxidize two molecules of fat. This has now been generally accepted, and diets are to-day made up so as to avoid having more than two molecular proportions of fat to one of glucose. Since the molecular weight of two molecules of stearic acid is 568, and the molecular weight of sugar is 180, then the ratio of fat to sugar in the diet should not exceed 568:180, or three parts by weight of fat to one of glucose. According to these observations, large amounts of fat may be used with safety in diabetes, provided the patient can burn about one-third of its weight of sugar. Theoretically, such a diet should give no ketosis, but it must be admitted that many patients do not behave according to rule. On the whole, however, the 'ketogenic—antiketogenic' or fat to sugar ratio in the diet is of great importance, and a realization of the facts as worked out on patients should help the medical man to arrive at the most suitable diets for his diabetic patients. There can be no doubt that some of the sugar passed in diabetes originates from the protein, but what weight of the ingested protein may appear as sugar is at present unknown. American investigators take the view that 58 per cent of protein by weight forms sugar in the course of metabolism, but according to W. Falta³ this may be as high as 80 per cent. On the whole, the best plan on which to work out a diabetic diet is to give the patient no more food than is required for his circumstances and stature, and, keeping in mind the close relationship of fat and sugar, to vary the carbohydrate of the diet from time to time if necessary, so as to get the minimum glycosuria and ketosis.

The old practice of starving patients at intervals during treatment is no longer necessary since the advent of insulin, but it is still carried out by many practitioners. R. Fitz and W. P. Murphy⁴ point out that any tolerance gained by such methods is more than counterbalanced by the weakness and loss of strength following the starvation; they emphasize the value of physical exercise combined with suitable diet to keep the patient fit. The vexed question as to whether a large amount of protein is *per se* prejudicial to the diabetic patient is discussed by Falta,⁵ who takes the view that protein does play a detrimental part in severe cases. Lyall,⁶ however, has carried out a thorough investigation on this question in the present reviewer's laboratory, and has come to the conclusion that there is no evidence whatever that protein has of itself any deleterious influence in diabetes, beyond the effect produced by the sugar and ketone substances which it forms in the body.

Glycosuria.—When sugar is found in the urine, the practitioner is always confronted with the problem as to whether or not this glycosuria signifies the presence of diabetes. W. R. Campbell⁷ gives a summary of the well-known causes of non-diabetic glycosuria. Among the most common conditions accompanied by sugar in the urine, he mentions the following: excessive intake of sugar, toxic goitres, anæmias, starvation, emotional stress, cerebral lesions, and pituitary disease. The glycosuria produced by the above causes he considers to be an accident in the course of the primary disease. It is, however, rather important to understand that an apparently innocent glycosuria developing as the result of some of these conditions may ultimately develop into a true diabetes. For instance, it is by no means uncommon to get quite definite diabetes in pituitary and thyroid lesions. Accompanying the glycosuria of all the above conditions there is definite hyperglycæmia, and in all cases of long duration in which excess of blood-sugar is a marked feature, diabetes may develop sooner or later. It is true that some patients may have definite hyperglycæmia for twenty years or more without apparently doing them any harm. On the other hand, everybody who has observed many of these cases of hyperglycæmia must have been struck by the fact that now and again one of them suddenly passes into a severe diabetic condition. It is, therefore, difficult to say what the significance of a persistent high blood-sugar content is in any particular case unless the patient has been watched for a long time. There is, for instance, very little difference between true diabetes and the condition of glycosuria which sometimes results from toxic absorption. In the latter case, however, the glycosuria may not get any worse for a very long time, while in the untreated diabetic patient it steadily progresses.

In discussing the glycosuria of renal diabetes, Campbell gives the following points as serving to differentiate this condition from true diabetes: (1) The patient suffering from renal diabetes has no symptoms except glycosuria unless he has previously undergone an excessively rigid dietetic régime resulting in weakness and emaciation. (2) These cases are usually discovered accidentally. (3) Excretion of glucose is small. (4) The glucose is unaccompanied by acetone bodies unless there are other causes for their presence, such as pregnancy or starvation. (5) Increased carbohydrate intake does not produce a corresponding increase in the glycosuria. (6) The respiratory quotient after glucose ingestion rises to 1, indicating that sugar is burnt in the normal manner. (7) The condition shows no tendency to progress even under adverse dietary conditions.

It is quite true that these features are usually found in patients suffering from renal glycosuria, but from the point of view of real help in diagnosis, by far the most important point is to determine the blood-sugar concentration before and after the ingestion of glucose. If sugar is excreted while the blood-sugar remains normal, then the condition is innocuous and has nothing to do with diabetes. The problem can be settled by this means in a couple of hours, while observation of the other differences mentioned would take months at least, and might result in giving unreliable conclusions at the end.

In cases of mild diabetes in which sugar is not constantly excreted, L. Jonas, T. G. Miller, and I. Teller⁸ state that, when the diet factors are the same for each of the three principal meals, the highest blood-sugar concentration occurs usually about one hour after breakfast, while the lowest is immediately before breakfast. From this they argue that the single specimen of urine which is most likely to show sugar is one voided from one to two hours after breakfast. In my experience this is true only in the case of certain patients; many mild diabetics pass sugar only in the afternoon after the second meal of the day, or in the evening after the third meal has been taken.

Sugar Threshold in Diabetes.—J. H. Roe and O. J. Irish⁹ examined 100 cases of diabetes in order to determine the concentration of blood-sugar that was present when sugar was excreted in the urine. In common with other observers, they found that marked variations in the blood-sugar level at which glycosuria occurs are observed in many patients, and that even in the same patient the sugar threshold often manifests striking changes. Generally speaking, the average individual does not pass sugar in the urine until the blood-sugar rises above 0.18 per cent or so; but in this series of cases, 48 patients passed sugar when the blood level was under 0.15 per cent. On the other hand, 21 patients passed no sugar in the urine when the blood-sugar was as high as 0.2 per cent or over; in 8 cases, a blood-sugar concentration of 0.25 to 0.21 per cent was present without glycosuria. Some evidence was obtained that the patients showing high blood-sugar without glycosuria were suffering from some degree of nephritis in addition to the diabetes, for casts were often found in the urine of these patients, and the dye test for renal function gave evidence of inefficient renal activity. R. H. Major and R. C. Davis¹⁰ give details of eight patients in whom no glycosuria was present though the blood-sugar varied from the region of 0.2 to over 0.4 per cent. These patients were receiving insulin, and appeared to do better when no attempt was made to lower the blood-sugar to the region of the normal value. In some cases, indeed, attempts to lower this high blood-sugar resulted in insulin symptoms coming on. The suggestion is made that possibly insulin changes the normal blood-sugar into some other substance not readily excreted, but which gives the same reaction as sugar when a quantitative estimation of blood-sugar is made. It is, however, agreed that the condition might be dependent on high renal threshold, but in this case it is difficult to imagine how insulin could act in the abnormal manner described. In an interesting communication, E. Wordley¹¹ shows that nephritis may frequently be combined with diabetes without any increase in the renal threshold for sugar. The importance of a raised renal threshold is that a patient may show no evidence of his condition by the usual examination of the urine for sugar. Despite some of the curious results just quoted, it is common experience that diabetic patients always do best when the blood-sugar is kept down to normal or nearly normal values, and that it is more or less essential to keep the blood-sugar down if the patient is to do well. In diabetics with high renal thresholds, as much as 0.4 per cent of sugar may be present in the blood, and yet the urine may give no reaction whatever with Fehling's solution. It is quite certain that the maintenance of a high blood-sugar would always act detrimentally in severe cases. Since the urine gives no evidence as to the state of the blood-sugar in these patients, it is always necessary to estimate the blood-sugar, and not to rely on testing the urine.

Diabetic Mortality and Incidence.—H. Emerson and L. D. Larimore,¹² from a study of mortality statistics, conclude that the increase in the incidence from diabetes in the United States, and in New York City in particular, has been more rapid than that of any other disease for which there are records for the last fifty years. This increase has been most marked among women at all ages and among both men and women over 35 years of age. This state of affairs is accounted for by the increase of carbohydrate food eaten, and the general superalimentation so prevalent in the States at present, the idea being that the excessive strain on carbohydrate metabolism fatigues and ultimately destroys the mechanism. According to J. W. Thomson,¹³ the diabetic mortality curve begins to rise rapidly at from 45 to 50 years of age, reaching its maximum at 80 years and then rapidly falling. In one period it was found that, between the ages of 10 and 15, 1 death out of 143 deaths was due to diabetes, while at 65 to 70, 1 out of every

125 deaths was a diabetic death. According to E. P. Joslin,¹⁴ a new race of diabetic patients has come on the scene, for the duration of the disease among patients entering hospital is getting steadily greater.

Infection in Diabetes.—The part played by infection in accentuating the symptoms of diabetes is emphasized by N. B. Foster,¹⁵ who points out, what has already been well recognized by everybody who has had much experience of diabetic patients, that coma is frequently brought on as the result of some infection. Such infections may be apparently slight, and may sometimes begin as common colds. This tendency to various infections, especially during the winter months, constitutes one of the greatest difficulties in the routine treatment of diabetes by insulin. G. Graham¹⁶ refers to 9 diabetic patients in whom coma developed; in no less than 7 of these, definitely local lesions causing toxæmia were found either during life or post mortem. In cases of coma complicated by infections, very large doses of insulin may be required.

Surgery in the Diabetic.—The risks of surgery in diabetes are well recognized. The reluctance of surgeons to operate on diabetic patients has been due to the fear of coma and the difficulties of wound-healing. L. T. Gager¹⁷ recounts the conditions that may demand operation in the diabetic, and divides them into two well-defined groups: (1) Those which are accompanied by infection; and (2) Those in which infection or sepsis is absent. As regards the second group, which includes such conditions as enlarged tonsils, enlarged prostate, or a uterine tumour, there is usually sufficient time for conservative treatment of the diabetic condition, so that according to Gager's view these patients may be expected to have an uneventful course. In the group with infection the problem is much more serious. The condition requiring surgical treatment may of itself be severe, and this is accentuated by the fact that carbohydrate metabolism is grossly disturbed when infection is present. The conclusion arrived at is that by the use of properly balanced and restricted diets, combined with adequate doses of insulin, carbohydrate combustion sufficient to prevent acidosis may be maintained even in very severe cases.

Whether or not attempts should be made to keep the blood-sugar down to normal in all cases of severe infection among diabetics is the subject of a considerable amount of discussion. Joslin¹⁸ maintains that in many cases the urine will not become sugar-free in the presence of a severe infection, and suggests that in such cases a vigorous attempt should not be made to get the patient's urine sugar-free either before or after the operation. Carrasco-Formiguera¹⁹ combats this view, and very strongly advocates an attempt to get the patient free from glycosuria in bad septic cases. He shows that even in the more severe infections in diabetic patients it is always possible (unless there is not enough time before the patient dies) to attain a normal blood-sugar level if insulin be used in sufficiently large doses. To do this, the amount of insulin required may be very large, and instances are quoted where 200 to 300 units of insulin were given in twenty-four hours. Whether or not it is necessary to get the blood-sugar down to normal limits in certain cases of severe infection in diabetes is not by any means settled, but apparently at present the consensus of opinion points to the importance of attaining this end.

No doubt, if the patient is doing badly, the use of very large doses of insulin, sufficient to give a normal blood-sugar, might be very beneficial; but, after all, it is difficult to understand the necessity for these very drastic measures in all cases. Sugar in the blood does little immediate harm; it is the accompanying acidosis that is responsible for the dangers attendant on such conditions. It might, therefore, be thought that treatment should be chiefly directed to a lowering of the ketosis. When the ketosis decreases markedly the patient is likely to do well irrespective of the blood-sugar concentration. N. B. Foster,²⁰

however, maintains that the urine should be sugar-free and that the blood-sugar should not exceed 0.2 per cent in all such infectious cases. Sometimes this can be accomplished by diet alone, but often insulin must be used. Similar views are held by M. G. Seelig,²¹ who makes the somewhat strong statement that "hyperglycaemia is the root of all evil in diabetes". Muller²² thinks that under modern conditions persons suffering from diabetes have almost as good a chance from operation as the non-diabetic, unless there is sepsis.

The practical point arising from all this discussion is the very important one that diabetic patients suffering from sepsis are in danger of succumbing from coma. If surgical interference is indicated they should, therefore, be operated on as early as possible. In many infectious states the patient cannot be got into a suitable condition for operation unless relatively enormous doses of insulin are used. Such patients should be put on a proper diet and insulin administered frequently until the blood-sugar is much reduced. If the first few doses of insulin have little effect, larger and more frequent doses should be given. As long as the blood-sugar remains moderately high there is no danger of insulin symptoms intervening; but if the patient is able to take food by mouth, this possible danger can be averted by giving some sugar. It may be necessary to give 200 or 300 units of insulin in twenty-four hours. By this means it is probable that some lives may be saved. It must not be forgotten, however, that the diabetic patient runs the ordinary risk from operation, just as does the normal patient, and that all deaths following operation on the diabetic subject need not necessarily be considered as always due to the diabetic condition.

The opinion is almost unanimously expressed in the literature that insulin has done much to reduce the special risks associated with the diabetic condition. E. H. Mason²³ points out that such conditions as diabetic gangrene are really much more hopeful now than formerly, for they often respond to the proper use of insulin, and quite satisfactory results are not infrequently obtained. In all cases of gangrene, when the large vessels are not hopelessly involved, treatment with insulin should be persevered with, for many unnecessary amputations may be avoided by this means.

Preparations Taken by Mouth in Diabetes.—From time to time claims are made that certain substances taken by mouth exercise a beneficial or curative effect in diabetes. Hugo Weiss²⁴ states that a salt of lithium and sodium combined with citric acid, to which the name *lithizit* has been given, possesses special properties in the treatment of diabetes. More or less similar claims have been made for the South African plant *Brachylaena elliptica*—('bitter blaar'), but a special investigation by Gunn²⁵ hardly supports these contentions.

So far, no alleged remedy when taken by mouth has been found to have any effect whatever in tending to cure or alleviate diabetes. The same can be said of the various pancreatic preparations for oral administration which are at present on the market. The reviewer has given an extensive trial to all such preparations that he could procure, and in no single instance did they produce the slightest beneficial effect. It is quite safe to say that, as far as any useful action in diabetes is concerned, these mouth preparations are entirely useless. Medical practitioners should use insulin and not these preparations in all severe cases of diabetes, for the prolonged use of these inert products does a great deal of harm in allowing the disease to progress to what sometimes proves to be a dangerous stage. The writer has seen several patients pass into coma while taking these preparations. These patients all recovered their health when given insulin in the usual way.

Insulin.—

Mode of Action.—J. J. R. MacLeod²⁶ discusses this fundamental problem,

but comes to no conclusion. In short, we have no idea whatever as to how insulin acts. Though the injection of insulin causes a rapid fall of sugar in the animal body, we are still in the dark as to what happens to this sugar. Apparently it does not form glycogen; that it is not oxidized is proved by the fact that the respiratory quotient rises only slightly when large amounts of sugar are given at the same time as the insulin. It is almost certain that the sugar must be changed into some intermediate body which does not give the ordinary sugar reactions and is at present incapable of detection. That the unknown substance may be some organic phosphate compound is rendered probable by the fact that insulin lowers the phosphate of the blood at the same time as the sugar disappears. This substance may be of the nature of the hexose-phosphate found by Harden and Young as an intermediate product in the fermentation of sugar by yeast.

Increased Tolerance as the result of Insulin Treatment.—Experience in the use of insulin more and more confirms the view that it does not tend to cure diabetes. No doubt, for some little time after beginning to use insulin the patient's tolerance for carbohydrate increases (J. Güdemann²⁷). This, however, seems to represent but a recovery of certain cells that had been weakened and rendered inefficient. There is no evidence suggesting the possibility of new pancreatic cells arising as far as the adult is concerned. In growing children, as mentioned in last year's ANNUAL, many observers have noticed a certain increase of tolerance continuing for a long time, though there are but few, if any, instances of recovery sufficiently marked to allow of insulin being discarded. In the growing child it is obvious that some such recovery might be expected, but it is rarely that an opportunity arises to demonstrate a definite histological basis for such a clinical improvement. Recently such an opportunity presented itself in Toronto. Boyd and Robinson²⁸ describe the case of a boy, age 9 years, who was known to have diabetes since he was 2 years old. In December, 1922, he was put on insulin, and after a year's treatment his tolerance for carbohydrate increased threefold. His physical condition also improved wonderfully, and from a sick ailing child he grew into a robust boy. When 9 years of age he was killed as the result of an accident, and an immediate post-mortem examination was carried out. Investigation of the pancreas showed that none of the histological changes found in diabetes were present. On the other hand, changes were seen which seemed to indicate a regeneration of the cells of the islets; also the β cells of the pancreas, which are supposed to be most concerned in carbohydrate metabolism, and are first destroyed in severe diabetes, were either normal or increased in number. This case adds weight to the clinical experience that there may be a possibility of actual repair of the pancreas in some cases of juvenile diabetes.

Insulin in General Practice.—It is steadily becoming recognized that insulin may be safely used in general practice provided the main principles on which the use of insulin depends are grasped. R. Fitz²⁹ suggests that practitioners should undertake the general treatment of diabetes by insulin on a wider scale than is at present the case. He takes the view that undernourished diabetics, young diabetics, diabetics with a surgical complication, and diabetics with acidosis or an acute infection usually require insulin, while elderly and obese diabetics do not. With regard to the latter statement it might be remarked that even fat and obese patients may require insulin when certain sequelae, such as optic neuritis, gangrene, severe muscular pains, and other complications, are threatening.

The question of *deterioration of insulin* in tropical climates has been investigated by Kingsbury,³⁰ who found little, if any, diminution of activity in a batch of insulin that had been stored at room temperature in India for six months.

Generalized œdema following the use of insulin is described by R. B. Gibson and R. M. Larimer.²¹ Very few reports of this untoward symptom of insulin therapy in diabetes have been reported in this country or in America, but the complication seems to be more common in Germany. In the cases described the œdema promptly disappeared after treatment with potassium bicarbonate and potassium chloride, 0.6 gm. of each three times a day with meals.

W. Weinberger and A. Holzman²² bring forward some evidence suggesting that insulin tends to lower the blood-pressure. In four cases described there was an appreciable decrease both in systolic and diastolic pressures a short time after the insulin was administered; this decrease was usually maintained for two hours. The authors agree that much more clinical and experimental work is necessary before any authoritative statement as to the effect of insulin on blood-pressure can be made.

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DIABETES, BRONZED. (See HÆMOCHROMATOSIS.)

DIARRHŒA, CHRONIC.

Robert Hutchison, M.D., F.R.C.P.

In an address on this subject, John A. Ryle¹ concludes, as others have done, that for clinical purposes the most convenient classification of the varieties of chronic diarrhœa is one based on the site of origin of the symptom. Thus one may speak of gastric, pancreatic, and colonic diarrhœa, and so on.

METHODS OF INVESTIGATION.—A careful history should be taken and the usual routine overhaul made. The special examinations required may be usefully subdivided into: (a) Essential clinical examinations; (b) Valuable and often essential accessory investigations which yet fall within the scope and province of the clinician; (c) Special examinations, for which it is usually preferable to obtain the co-operation of an expert in chemical, bacteriological, or radiographic methods.

The essential clinical examinations include inspection of the stools and a rectal examination, and should, strictly speaking, be omitted in no case of chronic diarrhœa.

The accessory investigations falling within the province of the clinician, but in which he may sometimes elect to obtain co-operation, include a direct inspection of the rectum or sigmoid through a proctoscope or sigmoidoscope; a simple microscopic examination of the stools for blood, pus, meat-fibres, etc.; a chemical examination of the stools for the presence of blood, or of a filtrate of the stools for albumin; and occasionally the examination of a blood-film. Observing the rate of passage of charcoal given by the mouth is another simple and sometimes useful test.

The special laboratory examinations include gastric analysis; examination of the stools for amœbæ, cysts, parasites and ova, fatty crystals, etc.; chemical

analyses of the fatty content of the stools; tests for pancreatic efficiency, and various bacteriological and serological procedures. For the study of the stools with a view to estimating the utilization of various foodstuffs it may be necessary to employ a special diet, such as that recommended by Schmidt. The radiologist may give useful information as to the rate of passage of an opaque meal through various portions of the alimentary tract, and an opaque enema may sometimes provide positive evidence of the presence of a colonic growth.

GASTRIC DIARRHŒA.—This variety is much commoner than is realized, and is not as well recognized as it should be. It results from absence or deficiency of HCl in the gastric juice. This can only be ascertained by a test-meal. The clinical features of a case of simple gastric diarrhœa are as follows. The evacuations are not as a rule very frequent, three or four stools in the course of the day being a common account, though occasionally they may be as numerous as six or eight. They are generally entirely unaccompanied by pain or colicky sensations—an important point in differentiating them from intestinal diarrhœas. The stools are loose and unformed rather than fluid. Owing to their rapid passage through the alimentary tract they are of a paler brown than the average normal stool. They contain neither mucus nor blood. In virtue of their rapid passage they may show microscopically the presence of undigested meat fibres. Schmidt pointed out that on a diet including raw or underdone meat, connective-tissue particles (which can only undergo digestion in the presence of gastric juice) may be readily recognized in the faeces of patients with gastric hurry and hyposecretion. The diarrhœa has a tendency to occur in the early morning and to be precipitated by meals. Associated symptoms, if any, are referred rather to the stomach than elsewhere. Epigastric discomfort, slight nausea and sinking feelings, intolerance of alcohol, fats, soups, and fluid meals are among the subjective complaints. The treatment includes, where possible, the removal of any likely cause of a secondary achlorhydria, such as alcoholic excess or dental sepsis. An alcoholic diarrhœa, perhaps more commonly seen in beer-drinkers than spirit-drinkers, will improve or clear up altogether if the patient succeeds in altering his habits, and it can be shown that an achlorhydria may under these circumstances be replaced by a normal secretory curve. In simple, unexplained diarrhœa associated with achlorhydria, in Addison's anemia, and in subacute combined degeneration of the cord, Hydrochloric Acid should always be given. As the antiseptic, as well as the physiological action of acid, is probably of real importance, it should be prescribed over long periods or continuously in every case of achlorhydric diarrhœa. Doses as small as 10 or 20 min. of the dilute preparation three times a day may be successful in checking the frequent evacuations; but if antiseptics is aimed at, doses of a drachm or more should be given. Taken with lemonade or orangeade with the three main meals it is quite a pleasant beverage.

DIARRHŒA ORIGINATING IN THE SMALL BOWEL.—There is only one important cause of diarrhœa in this group—namely, tuberculous ulceration of the ileum. For this reason, diagnosis should seldom be in doubt as (excepting in the far less common variety of localized ileocecal tuberculosis) there is nearly always active coexisting lung disease or abdominal tuberculosis. The frequency of the calls to stool is very variable, and it should, of course, be recognized that ulceration may be present with constipation. Generally the frequency bears some kind of relation to the extent of the disease. A common story is four to six actions daily—a rather higher average figure than in most cases of gastric diarrhœa, but a lower one than obtains in ulcerative lesions of comparable severity in the large bowel. In contradistinction to the gastric group, pain is a frequent and troublesome association. It is usually referred to the peri-umbilical and right iliac zones, and tenderness in the right iliac

fossa is commonly present. There is the same post-prandial tendency to looseness as in the diarrhœas of gastric origin, and hot soups and fluids are especially disturbing. The stools are soft or semi-fluid, and light in colour. It is rare for macroscopic blood or mucus to be present, but positive results with the benzidine, guaiac, and spectroscopic tests are obtainable. If the ulceration be very extensive, and particularly if there be much involvement of the mesenteric glands causing obstruction to the lymphatic flow, the stools may be copious and chalky-looking and contain excess of fats and soaps, while in virtue of the diarrhœa undigested meat fibres may be present. With appropriate technique tubercle bacilli can also be demonstrated.

DIARRHŒA ORIGINATING IN DISEASE OF THE COLON AND RECTUM.—This is a most important group, and includes the chronic phases of amœbic and bacillary dysentery, other forms of infective ulceration of the colon of unspecified origin, non-ulcerative types or stages of colitis, malignant ulceration of the colon and rectum, the terminal colitis of Bright's disease, certain spurious forms of colitis and diarrhœa, such as that which is commonly classified as 'muco-membranous', and those due to constipation, abuse of purgatives, and excess of douching. In this group more than any other careful rectal examination, direct inspection of the mucosa through a sigmoidoscope, and macroscopic and microscopic examinations of the stools, are of importance. It is in this group that serious mistakes are made through omission of simple examinations. It will probably have been within the experience of many to discover a rectal carcinoma, perhaps in a patient below the common age, primarily regarded and treated, sometimes for months, as a case of 'diarrhœa', 'colitis', or 'piles'.

In a considerable proportion of all cases of diarrhœa from active colonic or rectal ulceration, from whatever cause, blood, mucus, and sometimes pus will have been observed by the patient himself at some period of his illness. So long as ulceration persists, blood will be demonstrable microscopically and chemically, if not macroscopically, for the cells have not, as in bleeding at a higher level, had time to undergo disintegration. Leucocytes much more readily undergo disintegration, and for this reason their presence in large numbers points to a lesion low down in the large bowel or to an abscess discharging therinto. Pain, both colicky and (if there is extensive inflammation of the wall of the bowel) more continuous, and accompanied by tenderness, is a frequent but not constant association of all ulcerative forms of colitis. It is commonly referred to the lower abdomen, and especially to the region of the descending colon and rectum, and is most in evidence during or after defæcation. The diarrhœa may be continuous or intermittent, and, particularly in cases of malignant disease, may alternate with constipation. In an acute phase the evacuations are frequent and small, and consist largely of blood, mucus, and sometimes pus. In the more chronic phases they may be watery and intermixed with fecal material, the blood and mucus being less conspicuous. With growths low down in the colon and in the rectum the blood may sometimes be so intimately mixed with a watery brown malodorous evacuation as to escape the patient's notice. When not sufficiently obvious on a casual inspection, blood and mucus can often be made apparent by gently tilting the bed-pan—a receptacle which should always be employed in preference to others in suspicious cases; the viscid mucous fragments are then seen to slide more slowly across the white field than the fluid elements of the stool. Washing with water may also bring abnormal particles to light.

The Dysenteries.—In the case of the dysenteries it is important to recognize that both varieties (though more rarely if due to *Entamoeba histolytica*) may be acquired in this country, and that relapses after periods of good health are common. Of the two the amœbic variety is the more likely to give rise to a

chronic mild diarrhœa with little or no pain. Examination with the sigmoidoscope is of the greatest help in the diagnosis of non-specific ulcerative colitis and the dysenteries, and should never be omitted.

In *ulcerative colitis* and *chronic bacillary dysentery* all phases between a granular mucosa with a tendency to bleed easily, and extensive but usually superficial ulceration, may be seen. The ulcers, except in very severe types, are shallow, and their margins are not raised or undermined. The intervening mucosa is never healthy, appearing red, swollen, and easily bleeding. A film of muco-pus frequently covers the ulcerated areas. In cases of long standing a condition of generalized polyposis may develop.

In the chronic forms of *amœbic dysentery* seen in England it is rare to find extensive ulceration; but the appearances, though often slight and inconspicuous, may be completely diagnostic. The ulcers are usually quite minute and round, and appear as tiny central craters in a small elevation of the mucosa. The craters may be empty or contain a yellow slough, in which case they are not unlike small boils or carbuncles. The intervening mucosa looks healthy. After a few doses of emetine the whole mucosa may become absolutely normal in appearance.

The special laboratory investigations in the suspected dysenteries include a search for amœbæ and cysts; cultivations from particles of muco-pus or direct swabbings from an ulcer through the sigmoidoscope; and testing the patient's serum against known bacillary types.

CARCINOMA OF THE COLON.—In diarrhœa due to carcinoma coli the stools show the presence of blood and, if low down, of pus-cells. They are often very malodorous and fluid. When the accessible part of the bowel appears normal, but there is a clear history of blood and mucus, or these can actually be seen coming down from a higher level with the sigmoidoscope, growth should be strongly suspected. Radiography may sometimes be of the greatest value in the diagnosis, and particularly in the localization of a colonic carcinoma, but *negative radiographic evidence should never be accepted as final*.

DIARRHŒA DUE TO DISEASE OF THE PANCREAS.—Pancreatic diarrhœa is actually a very rare condition, though mainly on the strength of laboratory reports it has become rather a fashionable diagnosis in certain quarters. The chief feature of the stools in a true pancreatic diarrhœa is the passage of fat in the shape of oil or a fatty coagulum, or of oil which later congeals as a fatty layer. Microscopically fat globules are shown, and undigested meat fibres and starch are also present. The diastase test in the urine, or glycosuria, may give further evidence of impaired pancreatic function. Carcinoma, calculi, and chronic pancreatitis are among the conditions in which a true pancreatic fatty diarrhœa has been described. Fatty or chylous diarrhœa may also be due to blocking of the absorptive system from disease of the mesenteric glands, but this is rare. In all cases of fatty diarrhœa great improvement results from the restriction of fats in the diet.

Rarer forms of chronic diarrhœa are those due to chronic cholecystitis; to organic disease of the nervous system such as tabes; and what may be described as 'reflex' diarrhœa, from (for example) disease of the appendix. Emotional and nervous diarrhœas must also be borne in mind.

REFERENCE.—¹*Lancet*, 1924, ii, 101.

DIARRHŒA, FLAGELLATE. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

TREATMENT.—Hitherto we have lacked any efficient treatment of *Lambia* and *Trichomonas* diarrhœas, but Stovarsol has now been reported to be effective sometimes, M. Petzetakis¹ in a few cases having obtained good results in both flagellate forms with similar doses to those noted under amœbiasis, and

Deneux² confirms this opinion. R. W. Hegner³ advocates a **Carnivorous Diet** in this form of bowel trouble, as he found rats fed on such a diet were free from intestinal flagellates, and infected ones lost over 90 per cent of these parasites after being fed on a carnivorous diet for a week; he lays down elaborate diets for this purpose, which he has tried on one *Trichomonas* and two *Giardia* cases, with improvement in the stools and disappearance of the former parasite, and great reduction of the latter, so he thinks the method worthy of further trial.

REFERENCES.—¹*Presse méd.* 1925, March 7, 299; ²*Marseille-méd.* 1925, April 25, 673; ³*Jour. Amer. Med. Assoc.* 1924, July 5, 23.

DIPHTHERIA.

J. D. Rolleston, M.D.

ETIOLOGY.—F. M. Meader,¹ director of the Medical Service of the Detroit Department of Public Health, states that when virulence tests were taken in more than a thousand diphtheria carriers, only a few were found to have virulent organisms if they were not associated with a clinical case of diphtheria, whereas a very large percentage were found to have virulent organisms if they were associated with such a case. The conclusion to be drawn is that diphtheria carriers who have not been exposed to a known case of diphtheria may be ignored from the public-health point of view. In Detroit, children and infants who are found to be diphtheria carriers unassociated with a clinical case of diphtheria are permitted to return to child welfare clinics, and so far there have been no injurious results.

SYMPTOMS AND COMPLICATIONS.—In view of the rarity of *diphtheria in advanced life*, the case reported by G. W. Ronaldson,² which the reviewer had several opportunities of observing, is of considerable interest. The patient was a woman, age 94, who had a typical moderate attack of diphtheria treated by antitoxin. Except for slight and transient albuminuria there were no sequelæ. In some of the recorded cases of diphtheria in old age, the exudate has consisted of a small patch on a somewhat atrophic faucial mucosa. The paralysis noted in some cases did not differ from the types observed in younger patients. As the reviewer has shown (see MEDICAL ANNUAL, 1918, p. 159), the laryngeal form of diphtheria is very rare in adults of any age, and the prognosis is grave owing to the likelihood of extension of the membrane to the bronchi and lungs; but the occasional occurrence of the disease at this period of life has led Akesson to emphasize the importance of looking for diphtheria bacilli in the laryngitis of old people.

H. M. Marvin and R. C. Buckley³ record two fatal cases of *heart-block* in diphtheria which occurred in boys of 12 and 16 years. Electrocardiograms showed pronounced and progressive changes in the ventricular conduction system. In both cases the electrocardiogram showed the presence of heart-block before the diagnosis could be made clinically. The ventricular rate was rapid in both patients, and in one was totally irregular for several days before death. No autopsy was performed in the first case. In the second case extensive changes were found post mortem in the myocardium, with profound damage to the conduction system. The writers have also collected from the literature: (1) Nine proved cases of complete heart-block in 8 children and 1 adult 22 years of age; all but the adult died after the condition had lasted from a few hours to five days. (2) Two cases of 2:1 heart-block, one of which recovered and the other died. (3) Seven probable cases of complete heart-block in patients from 3 to 19 years of age, of whom all but one died, after the condition had lasted from one to three days.

G. W. Ronaldson,⁴ who reports two examples, alludes to the cases of diphtheria associated with symptoms of irritation of the nervous system which have been described by French writers under the name of *diphthérie spasmodique*.

The irritation may take the form of meningism or of pseudo-tetanic seizures. Previously recorded cases may be classified into three groups. The first consists of cases in which no diphtheritic membrane is found, and the clinical picture is that of an acute infection of the nervous system. Though no infective agent can be demonstrated in the cerebrospinal fluid, diphtheria bacilli can be cultivated from the saliva, nasopharynx, or conjunctiva. In such cases the initial diagnosis is usually cerebrospinal meningitis, rabies, or tetanus. In many cases of the kind the symptoms have abated rapidly after injection of diphtheria antitoxin. The second group, of which Ronaldson's first case is an example, consists of cases of clinical diphtheria with spasmodic nervous symptoms. In the third group, to which Ronaldson's second case belongs, the signs of nervous irritation appear after disintegration of the false membrane. Ronaldson considers that the number of well-authenticated cases on record is sufficient to warrant the statement that symptoms of nervous irritation may be met with in cases where diphtheria seems to be the only possible explanation, but considers that further proof is necessary before we can admit a diphtheritic origin for symptoms found in subjects who show no clinical signs of diphtheria. Commenting on Ronaldson's cases M. Critchley,⁵ under the title of *post-diphtheritic chorea*, records a case in a girl of 14, in whom symptoms of chorea developed in convalescence from diphtheria in association with the ordinary symptoms of diphtheritic paralysis, viz., nasal voice, paresis of accommodation, and generalized polyneuritis. Recovery took place within two months.

F. Fabris⁶ describes the first case on record of *diphtheritic osteomyelitis*. The patient was a man who, during an attack of diphtheria followed by paralysis, abraded his left upper arm. The wound, which was intensely painful, was a long time in healing and proved refractory to ordinary treatment. Under ether anæsthesia an operation was performed, when a cavity was found in the humerus. The organisms isolated from the scrapings proved to be virulent diphtheria bacilli.

Inability to dispense with the tube after tracheotomy is fortunately a rare condition, and the following case reported by R. Woods⁷ is probably unique. His patient was a woman, age 81, who had undergone a high tracheotomy for croup following scarlet fever at the age of 10, and had worn a tube ever since. The larynx appeared normal on phonation, but the rima glottidis did not open from ankylosis of the arytenoids. She had had good health since the operation, and after marriage at 28 had had seven children.

The Schick Test.—From an analysis of 5000 Schick tests at Edinburgh, W. T. Benson⁸ found that on an average 75 to 80 per cent, 60 to 65 per cent, and 50 to 55 per cent of lower-middle and poor-class children at the age periods 1 to 5, 5 to 10, and 10 to 15 respectively were susceptible to diphtheria. With increase in age and descent in the social scale, susceptibility to diphtheria tended to decrease. In 91.5 per cent of 600 families all the members gave the same reaction, or if they varied the younger gave positive and the older negative reactions. About half of those who had had an attack of diphtheria remained susceptible, as shown by the presence of a positive reaction.

The influence of the mode of introduction of diphtheria antitoxin into the body and the immunization of the individual has been studied by E. Lesné, M. Boutellier, and Langeron⁹ by means of the Schick test. They found that administration of antitoxin by the rectum never produced immunity, and that ingestion of dried serum also had no effect on a positive Schick test.

P. Lereboullet and P. Joannon¹⁰ draw attention to the occurrence of *spontaneous immunization* against diphtheria which they have observed in the surgical wards of the Hôpital des Enfants Malades, Paris, by a study of the

Schick test. Age, which under ordinary circumstances is the most important factor, was in this case of secondary importance, more negative results being found among children from 2 to 5 years old than among those of 5 to 6 years. On the other hand, the time of stay in hospital was the most important factor. Children who had been in hospital longest were refractory to diphtheria whatever their age might be, and only those children who had been in hospital a comparatively short time contracted the disease. Spontaneous immunization may take place in a latent manner or with symptoms of slight sore throat and rise of temperature. It seems to require healthy conditions of existence, including a vigorous defence on the part of the body invaded and an attenuated form of microbial attack.

The rarity of diphtheria in the newborn is borne out by the results of the Schick test at this period of life. A. Rorchi and F. Redlich,¹¹ who performed the test on 100 mothers and their children during the first eight days of life, found that 86 gave negative and only 14 positive reactions. These results confirmed those of previous investigators to the effect that in most of the newborn there is a sufficient quantity of antibodies present to defend the child against diphtheria. A positive reaction in the mother differed from that in the newborn by the redness and infiltration being always more intense, extensive, and of longer duration.

PROPHYLAXIS.—A. P. Hitchens¹² discusses the question whether the routine prophylactic use of diphtheria antitoxin is justifiable, and concludes that as diphtheria antitoxin is so perfect a therapeutic agent, it is safe to wait until the disease has manifested itself, except possibly in the case of very young children, provided those who have been in dangerous contact with the disease are kept under careful observation. The administration of diphtheria antitoxin may be followed by immediate or remote consequences of a disagreeable and possibly of an alarming or a dangerous character. Moreover, by masking the freshly produced carrier state among contacts the routine use of antitoxin prophylaxis may be a potent factor in maintaining the prevalence of diphtheria. On the other hand, active immunization is full of promise, and the occurrence of diphtheria provides the strongest possible argument for the extension of its application.

The superiority of Anatoxin (*see* MEDICAL ANNUAL, 1925, p. 113) to other modes of prophylaxis is emphasized by H. Darré, G. Loiseau, and A. Lafaille,¹³ who found that, in subjects who had been inoculated with anatoxin, the antitoxic content of the serum was present eleven months, one year, and thirteen months respectively after inoculation in greater amount than that required to make the Schick reaction negative. According to Lereboullet,¹⁴ at the Hôpital des Enfants Malades, Paris, anatoxin as a prophylactic has superseded diphtheria antitoxin, which confers only a transient protection. In most cases $\frac{1}{4}$ or $\frac{1}{2}$ c.c. of anatoxin is given, and repeated three weeks later.

TREATMENT.—The use of Intraperitoneal Injection of diphtheria antitoxin, to which notice was drawn in last year's MEDICAL ANNUAL, p. 113, has been carried out on a large scale by J. A. Toomey, O. L. Goehle, and C. C. Dauer,¹⁵ who record their observations on 168 cases of diphtheria treated by this method, with comparative observations on 100 cases of diphtheria, 50 of which received antitoxin by the intravenous and 50 by the intramuscular route. Like Platou, the writers found that the method was simple and safe, and they further simplified it by using commercial antitoxin without the addition of saline solution. With the exception of one patient, who had a violent reaction of five minutes' duration, all stood the injections well. The clinical evidence pointed to rapid absorption by the peritoneum. The membrane disappeared almost as quickly after intraperitoneal as after intravenous injection, without

the disagreeable reaction connected with the latter. While not recommending intraperitoneal injection for all cases of diphtheria, the writers regard it as a method of choice in cases of toxic myocarditis, where it is desirable to avoid the shock associated with intravenous injection, as well as in infants and children who have had diphtheria for more than two days and who have poorly developed veins.

J. Munk,¹⁶ who maintains that fatal collapse in diphtheria is due to an atony of the vascular system, declares that the blood-pressure raising action of **Adrenalin** may save life. He gives it intramuscularly in doses of 0.3 to 0.5 c.c. six-hourly, or per rectum in doses of 1 mgrm. to 50 c.c. of water.

A. Schlossmann¹⁷ maintains that *diphtheritic stenosis* as a rule requires no operative treatment, and that the mortality from croup is always less when **Intubation** and **Tracheotomy** are avoided than when these operations are performed for the relief of dyspnoea. The critical stage can be tided over until large doses of antitoxin have had their effect by the administration of sedatives and hypnotics, supply of fresh air, and avoidance of anything likely to excite the child, such as a steam tent or kettle. During the period 1909-19 all cases of diphtheritic stenosis were operated on at the Düsseldorf Children's Clinic, with a mortality of 31.9 per cent. During 1920-23 there were 128 cases of stenosis, with a mortality of 23.4 per cent; only 36 cases, or 28 per cent, were operated on, and 52.7 per cent died; whereas the mortality among 92 on whom no operation was performed was 11.9 per cent. Commenting on this paper, J. von Bokay¹⁸ states that, from 1905 to 1918, 2551 diphtheria cases, of which 1164, or 45.34 per cent, were laryngeal, were admitted to the Stephanie Children's Hospital at Budapest; 619, or 53 per cent, of the laryngeal cases escaped operation, and 555, or 47 per cent, were intubated, with 147 deaths—a mortality of 26.49 per cent. Von Bokay's operation mortality was thus considerably less than that of Schlossmann. While agreeing with Schlossmann that one should not be in too great a hurry to operate in laryngeal diphtheria, and while granting the good effects of narcotics in the early stage, von Bokay maintains that delay in operation after a certain stage is a neglect of duty on the part of the doctor.

Treatment of Carriers.—D. Kahn¹⁹ states that he had previously reported 185 cases of refractory diphtheria carriers, of whom as the result of **X-ray Treatment** 147 were released from quarantine through negative culture findings, while the remaining 38 were released through negative virulence tests. No case required more than four applications, and the average number was 1.4. In his present paper Kahn reports that 152 of the original 185 were recultivated ninety days after release from quarantine, and in only 26 was there a positive morphological culture, while not a single one showed virulent organisms. In a second series of 23 cases, negative results were obtained after one or at most two applications. The interval between each application varied between ten and fourteen days. Kahn claims the following advantages for X-ray treatment over tonsillectomy: (1) The possibility of 100 per cent cures; (2) It is absolutely painless; (3) It requires no anaesthetic; (4) It takes up the minimum amount of the patient's time, and affords him the maximum amount of comfort; (5) There is not the slightest danger, provided the applications are carried out by a competent radiotherapist. Kahn does not claim any bactericidal effects from X rays, but believes that the results are due to the fact that the tissues of the throat and nasopharyngeal space are altered to such an extent that, instead of being a suitable soil for the propagation of bacteria, they become decidedly unsuitable.

C. Israeli²⁰ successfully treated nasal diphtheria carriers with a 10 per cent

Ichthylol Ointment, which was passed on a swab into the nasopharynx through the nasal orifices, negative results being obtained after applications on five consecutive days.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, lxxxiii, 1132; ²*Brit. Med. Jour.* 1925, i, 733; ³*Heart*, 1924, xi, 309; ⁴*Brit. Jour. Child. Dis.* 1924, 182; ⁵*Ibid.* 188; ⁶*Gaz. deg. Osped.* 1924, 655; ⁷*Brit. Med. Jour.* 1925, i, 733; ⁸*Lancet*, 1924, ii, 949; ⁹*Arch. de Méd. des Enf.* 1924, 449; ¹⁰*Paris méd.* 1924, ii, 325, 533; ¹¹*Pediatrics*, 1925, 617; ¹²*Amer. Jour. Public Health*, 1924, xiv, 855; ¹³*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1925, 565; ¹⁴*Ibid.* 567; ¹⁵*Amer. Jour. Dis. Child.* 1925, xxix, 214; ¹⁶*Jahrb. f. Kinderh.* 1925, cviii, 218; ¹⁷*Deut. med. Woch.* 1924, 941; ¹⁸*Ibid.* 1210; ¹⁹*Amer. Jour. Roentgenol.* 1924, 343; ²⁰*Jour. of Lab. and Clin. Med.*, 1925, x, 536.

DISSEMINATED SCLEROSIS. (See SCLEROSIS, DISSEMINATED.)

DRAINAGE IN SURGERY. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Sir Henry Gray¹ deals with problems in connection with drainage in an original and thoughtful manner. He says that he drains the peritoneal cavity only in very rare cases, it matters not whether localized abscess or spreading peritonitis is present.

Gray believes in dealing thoroughly with the primary cause of the trouble and subsequent closure without drainage. He states that the cranial and cerebral surgeons went through the same stage as the general surgeons during the war, and that methods of drainage were adopted which promoted the development of those evils which they were meant to avoid. Later, the primary cause of trouble was dealt with, the missile was removed if possible, fragments of bone, pulped brain, or blood-clot were eradicated by various methods, and a drain was inserted 'down to but not into' the wounded brain.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1924, Aug., 321.

DRUG ADDICTION. (See ALCOHOL AND DRUG ADDICTION.)

DUCTLESS GLANDS. (See under the various glands.)

DUCTUS ARTERIOSUS, PATENT. (See HEART, CONGENITAL MALFORMATION OF.)

DUODENAL ULCER. (See GASTRIC AND DUODENAL ULCER.)

DYSENTERY, AMŒBIC. (See AMŒBIASIS.)

DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

DIAGNOSIS.—In view of the great importance of very early diagnosis and treatment of bacillary dysentery, and the two or three days required for bacteriological confirmation, even when a skilled pathologist and laboratory accommodation are available, F. G. Haughwout,¹ of the Philippines, emphasizes the immediate diagnostic value of the cellular contents of the mucous stools, allowing of correct diagnosis within two or three hours of the onset, as originally described by Willmore and Shearman. In this acute inflammatory disease of the mucous membrane of the colon the purulent exudate consists of 90 per cent of polynuclear leucocytes, mostly showing toxic necrosis, together with degenerated phagocytic endothelial macrophage cells in appreciable numbers, 'ghost cells' in which the necrosis has produced loss of all definite structure, and a few red corpuscles and plasma cells. In marked contrast with this, amœbic dysentery mucus shows active amœbæ containing red corpuscles, Charcot-Leyden crystals, and red corpuscles, with extremely few leucocytes.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1924, Oct. 11, 1156.

DYSMENORRHOEA.*W. E. Fothergill, M.D.*

An Irish doctor who was asked how he would treat a cold in the head said that he "would trate it with contimpt". This may or may not be a proper spirit in which to deal with a cold in the head; but it is certainly the modern attitude towards the dysmenorrhœa of healthy women. This may be seen from the reports of the discussion at the British Congress of Obstetrics and Gynæcology,¹ and again from the discussion on the subject at the meeting of the British Medical Association at Bradford in 1924.² The study of dysmenorrhœa by medical women in schools, colleges, and industrial concerns which employ large numbers of women has led to the publication of a number of the recent papers on the subject. These ladies see the matter from a point of view quite different from that of the hospital surgeon and gynæcological specialist. They regard exercise as both preventive and curative, and advise its continuance throughout the period. The hot bath is also recognized as valuable. But the main point is that the patient shall be taught to regard menstruation as a normal function which should give no pain and should not be anticipated as a time of invalidism. S. Elizabeth van Duyn³ publishes some observations on dysmenorrhœa at Gaucher College which bring out in striking manner the improvement which has been brought about in that institution by the freer clothing and more athletic life of women during recent years, combined with a more sensible attitude on the part of both the mothers and the girls themselves towards menstruation. In the years 1900-7 the figures were: no menstrual handicap 62·6 per cent; slight menstrual handicap 30·3 per cent; serious menstrual handicap 7·1 per cent. In 1917-23 the figures were altered to 74 per cent, 23 per cent, and 3 per cent. In the year 1923-4 the figures were again better, namely, 86·6 per cent; 13·1 per cent; and 0·3 per cent respectively. Such are the results secured by treating dysmenorrhœa with contempt, after ascertaining, of course, that the patients are healthy girls and women.

REFERENCES.—¹*Med. Ann.* 1924, 136; ²*Brit. Med. Jour.* 1924, ii, 558; ³*Amer. Jour. Obst. and Gynecol.* 1925, Feb., 234, and April, 524.

DYSPEPSIA, FLATULENT INTESTINAL. *Robert Hutchison, M.D., F.R.C.P.*

Cramer¹ draws attention to this form of indigestion, which he regards as common and not as well recognized as it ought to be. The patients are mostly elderly men of sedentary habits; land-workers are not often affected. The chief symptoms are flatulence, both gastric and intestinal, with colicky pains and distention of the abdomen which may necessitate loosening of the clothes after meals. The motions are irregular, variable in colour and consistence, and often offensive, and the patient is apt to complain that after a motion the bowel does not feel properly emptied. The distention of the abdomen interferes with the heart and the action of the diaphragm, so that palpitation and dyspnœa may be secondary symptoms. Mental depression is often a prominent feature. The chief physical signs are distention of the abdomen, with sometimes tenderness over the sigmoid and a palpable cæcum. The percussion note is duller on the left side than on the right. Intestinal dyspepsia is probably the result of several factors. An unhealthy mode of life, excesses in food, drink, and tobacco, atony of the intestinal wall, and defective intra-abdominal circulation all play a part.

TREATMENT.—The mode of life must be regulated; Meals should be small and well chewed, and all foods rich in cellulose (fruit, green vegetables, brown bread, etc.) avoided; beer should be forbidden. Charcoal, Magnesium Perhydrol, and carminatives are useful.

Massage, Electrical Treatment, and Exercises help to tone up the intestine

and abdominal wall. *Belladonna* may be used to relieve pain, and mild laxatives administered if required. Treatment must be prolonged, as the disorder is very resistant.

REFERENCE.—¹*Munch. med. Woch.* 1924, Dec. 19, 1901.

EAR, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

MIDDLE EAR.

Acute Otitis Media.—As in other branches of practice, so in otology, attention is being increasingly directed towards the preventive aspect of medicine. Somerville Hastings,¹ under the title of *The Preventive Medicine of the Ear*, points out what has been achieved up to the present, and emphasizes the need for further efforts in the future. Statistics show that cases of otorrhœa amongst school children have been reduced by at least one-half in ten years, while the proportion of cases at the age of admission to school remains unaltered. This argues that otitis media and its causes do not receive adequate attention in infants and very young children. That this is the case every otologist will agree. In every case of otitis media, infection gains entry via the Eustachian tube, and every baby with symptoms suggesting earache or with signs of difficulty in breathing or suckling should have its nasopharynx investigated. In infants, adenoids can be removed without an anæsthetic and without appreciably upsetting the child. After the removal of adenoids, greater attention should be paid to breathing exercises, and children should be instructed in the correct method of blowing their noses. This latter should be done with the handkerchief held below the nose and not pressed against it, so as to avoid the risk of forcing infected material up the Eustachian tubes.

The opinions expressed in a discussion on the importance of the *early treatment of acute otitis media*, opened by J. F. O'Malley,² were: In the early stages, the question of incision of the membrane is still undecided. While an incision whenever the membrane is injected is sometimes advised, the more general and probably sounder practice is to reserve this minor operation for cases in which pain or fever persists in the absence of discharge, particularly if the membrane is bulging. While the removal of adenoids, the primary cause of the trouble, has not been generally done during an acute otitis, this practice seems undoubtedly to be gaining favour, and, in the discussion, several speakers advised removal of the adenoids at the same time as the incision of the membrane. In regard to the opening of the mastoid process, it is now the accepted practice, where permission can be obtained, to drain the middle-ear spaces by this route in all cases in which suppuration persists for more than two or three weeks. This operation almost invariably results in a rapid cessation of the inflammation, thereby preventing damage to the hearing. The indications of suppuration in the mastoid are, of course, generally recognized, and the good results obtained by operation on such cases in the past have led to the more general adoption of this operation as a means of conserving the hearing in cases of acute suppuration.

In regard to the *non-surgical treatment* of cases, Trétop³ advises the following routine: The solution used is a freshly prepared one of 1-1000 Bichloride of Mercury in water, with the addition of an equal part of Glycerin. A careful toilet of the external ear is carried out every day, or every alternate day, according to the severity of the case, by swabbing out the passages with cotton-wool mops moistened with the solution. In the intervals the same solution is employed as an instillation every two hours, the head being held in the horizontal position for three minutes following the application; and this is followed by lightly packing the meatus with a wick of gauze moistened with

the same, which is removed at each dressing. He considers that he has obtained resolution by these measures in a number of cases in which a mastoid operation appeared to be inevitable. An inflamed condition of the skin of the meatus is a contra-indication to this treatment.

D. T. Smith⁴ has found **Hydrogen Peroxide** diluted one-half with water to be preferable to mercurial solutions in the treatment of otitis.

In regard to the alternative methods, wet or dry, i.e., the removal of the discharge from the meatus by dry mopping or by gently syringing, either method seems to be effective. The former is preferable perhaps where it can be efficiently carried out, but this is frequently impossible. Thoroughness, cleanliness, and regularity in the clearing out of the meatus are probably more important factors than the choice of any particular antiseptic used.

Dan Mackenzie,⁵ in addition to the classical *indications for operating on the mastoid in acute middle-ear infections*, such as persistence of fever after the membrane is opened, continuance of mastoid pain and tenderness, copious or long-continued discharge, etc., regards extreme severity of the initial symptoms as an indication for operation, and with this opinion the reviewer would agree, particularly as regards adults. High initial fever, with general malaise, headache, and bloody discharge, may be mentioned as such initial symptoms. In these cases, after operation, a severe skin reaction, frequently amounting to erysipelas, develops. The operation should be limited to supplying drainage.

Latent Otitis in the Child.—Post-mortem examinations in infants frequently reveal middle-ear suppurations which have not been diagnosed during life. J. Le Mée and M. Bouchet⁶ discuss the various theories which have been advanced to explain this fact. These are: (1) That the suppuration is an agonal event; (2) That the pus has passed into the tympanum from the nasopharynx; (3) That the condition is a true otitis. Earache and fever usually indicate the onset of acute otitis in infants. In these latent cases, however, pain is slight or absent, and fever and a general poor condition of the infant alone mark the disease. The diagnosis must rest on the objective appearances of the membrane. This may be injected or a dirty-grey in colour, with absence of the light reflex. If the result of the examination of the membrane is either doubtful or positive, a wide **Paracentesis** should be performed. When this has been done, the suppuration will usually clear up more readily than in cases of ordinary suppuration. Otherwise, the treatment of latent otitis is similar to that of other varieties.

Mastoiditis Simulated by Disease of the Sphenoid.—H. W. Lyman⁷ draws attention to the fact that pain associated with sphenoidal-sinus suppuration may lead to a mistaken diagnosis of disease in the mastoid process. In analysing a series of such cases, he finds that the salient features are: (1) The marked psychoneurotic element in each case; clinically, the pain and suffering described by the patients were out of all proportion to any possible cause in the mastoid region, and these symptoms had continued over a period of years without developing any gross pathology. (2) In each of these cases, while the tenderness was very marked over a large area, there was a point of extreme sensitiveness a short distance behind the mastoid process. (3) Opening the sphenoid and ethmoid sinuses resulted in marked amelioration of the mastoid symptoms.

Septicæmia in Acute Otitis Media.—G. J. Jenkins⁸ considers that, while the intracranial complications of otitis media receive wide attention, septicæmia is almost as frequent but receives little recognition. Failure to recognize the middle-ear infection in the early stages of septicæmia is disastrous. Septicæmia is probably more common with infections of the ear, nose, and throat,

especially the ear, than with any other part of the body, including the pelvis. While septicaemia can only be recognized with certainty by the growth of organisms from the blood, it probably occurs very much more frequently than this test would seem to show. It may arise at any stage of the middle-ear inflammation, and this occurrence, as a rule, profoundly modifies the local signs in the ears. This necessitates very careful examination of the ears in all cases of septicaemia. After operation in such a case, the general symptoms predominate, and the mastoid wound, characteristically, shows no signs of reaction, but resembles a wound in the cadaver. As immunity becomes established, signs of reaction appear in the wound.

The middle-ear condition should be thoroughly dealt with by opening the mastoid and incising the membrane. C. T. Porter⁹ advocates the intravenous use of Mercurochrome-220 solution in cases of aural septicaemia. The dosage varies from 3 to 5 mgrm. per kilo. of body weight, the smaller dose being used in the more severe cases. Acute nephritis is a risk, and the dosage should not be repeated until any evidence of this subsides. Three successful cases are reported.

Chronic Suppurative Otitis Media: the Radical Mastoid Operation.—There is a widespread and satisfactory tendency to modify operations in cases of chronic suppuration to suit the individual case, and to reserve the classical radical mastoid operation for the most severe types. The disadvantages in the radical operation are chiefly associated with the difficulty in obtaining epithelialization of the cavity and with the poor functional result. Bárány,¹⁰ for some years, has avoided cutting any meatal flap. The antrum and attic are opened up and the posterior bony meatal wall removed without disturbing the membranous meatus. The ossicles and other middle-ear structures are left as far as possible. Adolf Schulz,¹¹ to obviate the difficulty of lining the cavity, has advised a pedicled flap to be turned into the cavity from the skin behind the ear.

As regards the results of the classical radical mastoid operation, P. Henius¹² examined 135 cases which had been submitted to the radical mastoid some years before. Of these, 45 per cent were found to be completely cured, but the remaining 55 still showed some suppuration in the cavity, usually about the region of the Eustachian tube. E. W. Gutteridge¹³ points out that the failure to obtain a complete cure, with the resulting necessity for after-treatment, is due to three factors: the constant desquamation of the epithelium lining the cavity, the ceruminous secretion from the glands of the skin of the meatus, and the low vitality of the lining of the cavity. The tympanic membrane and deep meatus are normally protected by the depth and narrowness of the meatus, the hairy palisade at its entrance, and the cerumen which entangles and extrudes foreign bodies. In the radical mastoid operation these protections are done away with, owing to the plastic operation on the meatal wall. To obviate these disadvantages, he suggests that the antral cavity should be obliterated by fibrous tissue, as is the case after the performance of the Schwartz operation. To do this, it is necessary to prevent the epithelium from spreading over the cavity of the antrum while the granulation tissue is forming. The post-aural wound is closed at the time of operation, and the growth of epithelium is checked by painting with trichloroacetic acid.

Intracranial Complications of Otitis Media.—

Brain Abscess.—MacCuen Smith¹⁴ considers the value of the *vestibular tests* in the diagnosis of brain abscess. His conclusions are that they are useful in that frequently they are the only tests indicating with any degree of definiteness the presence of intracranial involvement. There is nothing about them

that would directly suggest an abscess, but what they do indicate is the presence of increased intracranial pressure. Given a case of unoperated aural suppuration, or one where the operation has been performed and the patient is not doing well, the findings of a spontaneous vertical nystagmus or of a loss of responses from the vertical semicircular canals, without such a loss from the horizontal canal, or of a perverted nystagmus after douching, etc., at once leads us to suspect very strongly the presence of some intracranial lesion. When the general clinical picture and laboratory tests exclude everything except brain abscess, the vestibular examination might indicate whether such an abscess is in the cerebellum or temporal lobe. The ability to elicit vertigo and past-pointing after stimulation will eliminate the cerebellum and suggest the temporosphenoidal lobe as the probable site of the trouble.

Inasmuch as intradural suppuration does occur without indicative manifestations, it is a wise precaution to determine the labyrinthine reactions prior to all mastoid operations for the relief of a chronic otorrhœa, as sometimes the Bárány tests give the only clue to an intracranial lesion.

Cerebellar Abscess.—J. S. Fraser,¹⁵ in a discussion, gave his experiences with 8 cases of cerebellar abscess. Of these, only 1 followed an acute middle-ear suppuration; 4 of the cases recovered. As far as the route of infection is concerned, there was labyrinthine suppuration in only 2, an extradural abscess, with or without sinus thrombosis, being present in the remainder. The semicomatose condition of the patient, when first seen, frequently prevents a complete examination. Headache was present in all, in 2 cases being frontal as well as occipital. Drowsiness was almost constant, with a furred tongue and emaciation. Rigors, etc., when present, were due to an associated lateral-sinus infection. Some change in the optic disc was present in 5, being well marked in 2. In only 2 of the cases were a typical subnormal temperature and slow pulse present, associated conditions causing fever and a rapid pulse in the remainder.

Localizing symptoms: Giddiness or loss of balance was only present in two. Spontaneous nystagmus was absent in one case but present in the others; it was variable in direction, being either to the sound side, the side of the lesion, or both. It is characteristic that the direction of the nystagmus changes, and its presence on one occasion and absence on another is typical. According to Bárány, there is no connection between the direction of the nystagmus and the direction in which the patient tends to fall, and further, the direction of the fall is not influenced by the position of the patient's head or by the caloric test. Tenderness on percussion over the cerebellar fossa was present in two cases. An error in pointing tests was present on the side of the lesion in half the cases, as was dysdiadokokinesia, i.e., lagging of the upper extremity on the side of the disease in pronation and supination tests. Knee-jerks were increased on the side of the lesion in the majority of cases. Paresis on the affected side was not found to be of much help. In only half the cases was the diagnosis sufficiently defined to enable the abscess to be opened at the first operation.

The discussion showed that there is a certain risk in delaying operation until a diagnosis has been firmly established, sudden death in these cases being not infrequent. It would therefore seem advisable to establish a diagnosis at the earliest possible moment. The performance of lumbar puncture introduces certain risks, and is probably inadvisable if the diagnosis is reasonably certain without it.

E. J. Moore,¹⁶ to get over the mechanical difficulties involved in the efficient drainage of cerebellar abscess, has introduced a metal bivalve held apart by a light spring which, on insertion into the abscess, maintains a permanent opening and prevents pocketing.

INTERNAL EAR.

Nerve Deafness : Toxic Neuritis of the Eighth Nerve.—Arthur B. Duell¹⁷ emphasizes the importance of lesions of one or both branches of the eighth cranial nerve by toxic products carried by the blood from any part of the body. Although the exact pathological changes are unknown, existence of this condition is undoubted, just as is a neuritis of the sciatic nerve under similar affections. The optic and auditory nerves seem to be more prone to this kind of injury than the other cranial nerves. Since the eighth cranial nerve is made up of two distinct bundles, one concerned with hearing, the other with equilibration, in one common sheath, it follows that a perineuritis causes pressure on both, with perversion of both functions. This has given rise to the symptom-complex consisting of vertigo, with nausea and vomiting, nystagmus, impairment of hearing, and tinnitus. This *symptom-complex, described by Ménière*, does not necessarily mean an exudate into the labyrinth, although his original classical case was probably due to this. Cases of toxic neuritis exhibit many variations in severity, from slight upset in the function of one or both branches of the eighth nerve to complete loss of function in both. This conception of a toxic neuritis explains the partial or even complete recovery sometimes observed as a result of treating a focal septic lesion, such as a nasal sinus suppuration or infected tooth. It is possible that a similar neuritis may explain the addition of a nerve deafness in cases of middle-ear catarrh or otosclerosis. From a practical point of view, the lesson is that in all cases of nerve deafness, particularly if associated with vertigo, etc., a careful search should be made for sources of toxæmia, as is now so generally done in cases of chronic joint affections.

Vertigo.—R. Lake¹⁸ has considered the influence of variations in blood-pressure on the diagnosis and treatment of vertigo and tinnitus. While he was previously of the opinion that an increase in the blood-pressure, with corresponding increase of the intralabyrinthine pressure, was a frequent cause of these symptoms, he has now come to the conclusion that this is seldom the case. A high blood-pressure, he says, is extremely rare in cases of vertigo. One of the chief characteristics of the vertiginous attacks associated with subnormal blood-pressure is that the patient wakes up giddy, and, on attempting to get up, has to return to bed. If associated with nausea or vomiting, the attack is frequently diagnosed as 'biliousness'. In this class of case, *the use of tobacco* seems to have a very considerable effect, and its cessation may of itself be sufficient to cure the symptoms. A difficulty arises in cases of commencing arteriosclerosis, as in these, although the blood-pressure may be normal for a healthy person, it is relatively low. Vertigo will sometimes originate when the blood-pressure has been artificially lowered. In regard to the **Operative Treatment** of tinnitus and vertigo, the former being—at any rate after its early stages—central, operation on the labyrinth is useless. In cases of intractable vertigo, as a last resort, operation on the labyrinth will usually cure.

RE-EDUCATION TREATMENT OF DEAFNESS.

It is generally acknowledged that, up to the present, the treatment of the chronic progressive deafness associated with chronic catarrhal changes in the middle-ear, otosclerosis, and lesions in the auditory nerve mechanism, has been essentially unsatisfactory. Rather more than ten years ago, the so-called re-education method was introduced, but, so far, it has not received much recognition from the majority of otologists. The instruments employed have been Dr. Maurice's kinesiphone and the electrophonoide of Zund Bourguet. Attention has recently again been drawn to this method by G. C. Cathcart,¹⁹

who, employing the **Electrophonoide**, has reported on the results of the treatment of 100 cases of chronic progressive deafness, all of which had been dismissed as incurable by two or more otologists. He states that 68 per cent of these cases have been improved. The treatment consists essentially in a stimulation and reawakening of the function of hearing. To effect this, the instrument reproduces sounds corresponding to the whole gamut of the human voice, from 80 to 3500 vibrations. This is done by sliding platinum contacts along vibrating platinum lamellæ, the action resembling the movement of the fingers over the strings of a violin. The sounds are transmitted to the ear by modified telephonic receivers. By means of a secondary current a vibratory massage can be simultaneously produced. The personality of the experimenter, he states, bulks largely in the result of the experiment. The instrument has been in his use for several years. The disadvantages of the treatment are that it is not possible to tell from tests beforehand whether it will be useful or not, and secondly, any improvement obtained lasts as a rule only six to nine months, when a further course is necessary. A preliminary course of twelve treatments is employed, and, if improvement takes place, then a complete course of thirty sittings is carried out. For practical purposes, tests by the voice are the only ones of any use. In answer to the criticism that it is difficult to maintain a constant strength with the voice, he states that he has made a special study of this and is confident that he has attained uniformity. Of the 100 patients, 34 suffered from a nerve deafness, 33 from chronic otitis media, and 33 from otosclerosis. Tables are given as to the results of treatment on either ear. Of the total number of cases, 68 per cent have definitely improved. These comprise 81 per cent of cases of nerve deafness, 67 per cent of cases of chronic otitis media, and 55 per cent of cases of otosclerosis. As regards tinnitus, the records show that this treatment not only alleviates but often causes it to disappear completely.

In regard to the experiences of others with this treatment, Hellsmoortel, of Antwerp, and Raoult,²⁰ of Nancy, both reported good results in 1913. In this country, Muecke, in 1914, reported that his results with this method had not been satisfactory. Of 36 cases treated, 1 neurasthenic was cured, 3 cases were improved, 10 showed some improvement but relapsed later, and 22 were not altered. Mackenzie Booth and W. G. Porter,²¹ in 1914, reported promising results, but the number of cases treated was very small.

To sum up the present position in regard to this treatment, as a result of Cathcart's work it is enjoying some popularity. As far as its effectiveness is concerned, judging by observations made in discussion, the majority of otologists have not found the method produces any appreciable improvement in the hearing power. It is probable that the mental factor is an important one. Any new treatment which encourages the patient to use such hearing as remains to him will, no doubt, produce temporary improvement. That cases of pure functional deafness might be cured by this treatment is obvious. Practical difficulties in its use are that the apparatus is extremely expensive, that as many as thirty sessions for each case are necessary, and that therefore a very large amount of time must be devoted to the cases by the surgeon. In addition, a fresh course of treatment is necessary after an interval of about six months. At the moment, therefore, the treatment should be regarded as being on trial. Where nothing else can be done and the opportunity offers, patients might fairly be advised to undergo it, as long as they are not led to expect too much.

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⁷*Laryngoscope*, 1924, Dec., 948; ⁸*Jour. Laryngol. and Otol.* 1925, June, 357; ⁹*Boston Med. and Surg. Jour.* 1925, June 25, 1239; ¹⁰*Acta Otolaryngol.* vol. vii, fasc. 1; ¹¹*Arch. f. Ohren-, Nasen-, u. Kehlkopfheilk.* 1924, Dec., cxii, part 2; ¹²*Acta Oto-Laryngol.* 1924, iii, Feb.; ¹³*Jour. Laryngol. and Otol.* 1925, March, 174; ¹⁴*Laryngoscope*, 1924, July, 534; ¹⁵*Brit. Med. Jour.* 1924, ii, 993; ¹⁶*Rev. de Laryngol.* 1924, Feb. 24; ¹⁷*Jour. Amer. Med. Assoc.* 1924, Oct. 11, 1129; ¹⁸*Lancet*, 1925, i, 1117; ¹⁹*Ibid.* 968; ²⁰*Arch. Internat. de Laryngol., d'Otol., et de Rhinol.* 1913, July, Aug., Sept., Oct.; ²¹*Jour. Laryngol. and Otol.* 1914, Sept., 469.

EAR, PAINFUL NODULAR GROWTH OF.

E. Graham Little, M.P., M.D., F.R.C.P.

O. H. Foerster¹ drew attention to this condition in 1917, when he published a description of four cases. Winkler, of Lucerne, had apparently described the same condition in 1913 under the term "chondrodermatitis nodularis chronica heliis"; but his paper was not observed by Foerster until after his own publication. Since that date Foerster has seen 10 cases. The general feature of the condition is the development of a round nodule from 3 to 10 mm. in diameter on the antero-lateral surface of the helix of the ear (*Plate VI*); usually attended by pain on pressure; rarely showing ulceration. Occasionally, there is some scaling over this lesion. The lesion is not unnaturally mistaken for epithelioma, but Foerster has been able to obtain sections in 4 cases, and these showed a chronic inflammatory process in the corium, involving the cartilage, with a consequent hypertrophy of the epidermis. In two instances hyaline degeneration and necrosis had occurred. The histological picture differentiates this condition from warts, keratosis, epithelioma, clavus, and other forms of growth. The causation is entirely unknown. So far only men have been affected, between the ages of 27 and 68. Untreated, the condition may last for many years. In 4 out of 23 cases the growth was bilateral. The resemblance to epithelioma is strengthened by the presence, in some cases, of a small central ulceration of the nodule. In only one case did the nodule disappear spontaneously, after lasting for 18 months. Recurrence, after excision, was observed in one case. Radiation by X Rays (sub-erythematous dose at intervals of a week) or Radium is sometimes effective. But if this does not eliminate the nodule after a few treatments, it should be freely excised, as the pain of lying upon the ear is considerable.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1925, Feb., 149.

ECLAMPSIA. (*See PREGNANCY.*)

ECTROPION, ENTROPION. (*See EYE AFFECTIONS, GENERAL.*)

ELBOW-JOINT FRACTURES IN CHILDREN. (*See FRACTURES.*)

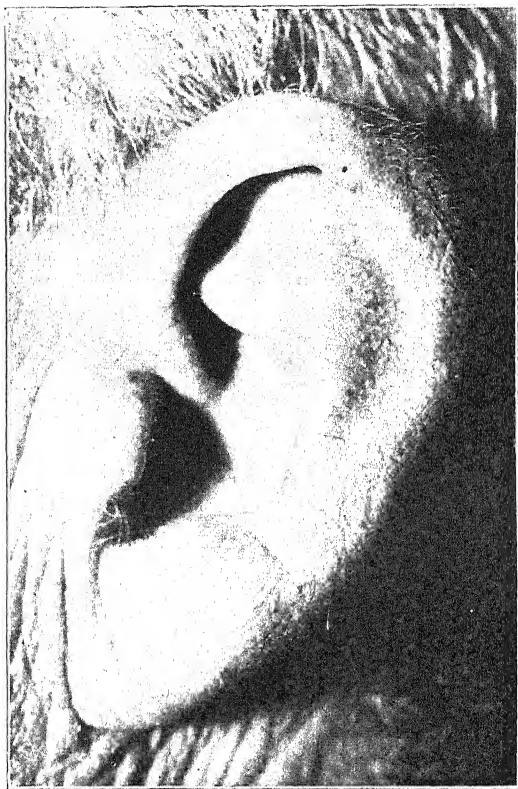
ELECTROCARDIOGRAPHY. (*See HEART, EXAMINATION OF.*)

EMPYEMA. (*See also CHEST, SURGERY OF.*) *W. H. Wynn, M.D., F.R.C.P.*

F. Saltzman and O. Sievers¹ have investigated the subsequent fate of patients who have suffered from empyema, in order to throw light on a problem towards which the attitude of Life Insurance societies is not uniform. The fate of 128 patients in two hospitals at Helsingfors, who had been treated for empyema in the period 1902-12, was discovered. Of 19 who had died, only 3 were known to have died of tuberculosis. There were 5 deaths from unknown causes. A comparison of the death-rates among the 128 patients with that of persons of the same age in the general population showed that the death-rate for the former was 20 per cent above the average. This abnormally high rate was greatest from five to ten years after the empyema was contracted. After

PLATE VI.

PAINFUL NODULAR GROWTH OF THE EAR



*By kind permission of the
'Archives of Dermatology and Syphilology'*

an interval of ten years the death-rate is not in excess of the average. The causes of death other than tuberculosis were very varied; they included bronchiectasis, influenza, heart disease, and epidemic encephalitis. The chance of developing tuberculosis is not much, if at all, greater than the average, and this is very great in Helsingfors, where, in 1916, 550 of 2078 deaths were due to tuberculosis. They also made another series of investigations in Nummela Sanatorium. Of 3557 patients, in only 9 was there a history of empyema, and in 5 of these pulmonary tuberculosis had been diagnosed before the empyema developed.

H. C. Cameron² calls attention to the very high mortality of empyema in the first two years of life. Almost all statistics show a death-rate of about 75 per cent in the first year and 50 per cent in the second. In the third year there is a drop to about 18 per cent, and thereafter the figure remains constant at about 6 per cent. The high mortality in the first two years is due to the character of the pneumonia. In older children and adults it is favourable when the rise of temperature due to the pneumonia is separated from that due to the empyema, i.e., the empyema is metapneumonic. It is unfavourable if the empyema develops when the pneumonic process is still active, and when the curve of pyrexia due to the empyema is superimposed upon the curve due to the pneumonia, i.e., the empyema is synpneumonic. Within the first two years pneumonia tends to be of long

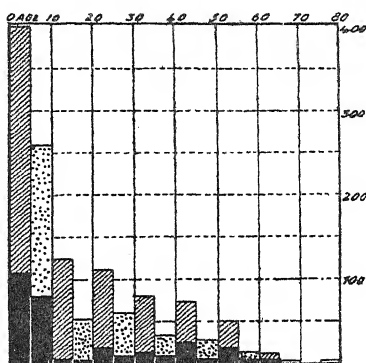


Fig. 7.—Cases of acute empyema in the London Hospital, 1909-23 inclusive. Age incidence and mortality. Left-hand columns male, right-hand female.

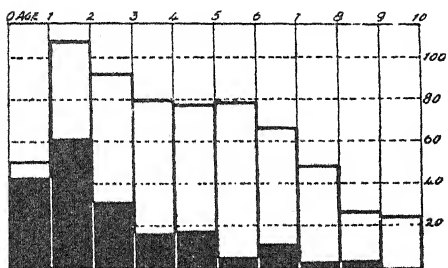


Fig. 8.—Cases of acute empyema in the London Hospital under the age of 10, in the years 1909-23 inclusive. Age incidence and mortality. (Figs. 7, 8 re-drawn from the 'British Medical Journal'.)

duration, and it is the exception to get a short-lived pneumonia with lobar distribution and termination by crisis. Synpneumonic empyema is very frequent at this time. In the third year of life the type of pneumonia changes, and the short-lived lobar type becomes established and metapneumonic empyema becomes the rule. The high mortality of empyema in the first two years of life is due to the greater tendency for the infection to give rise to infection in parts remote from the lungs, e.g., the meninges, middle ear, pericardium, or peritoneum. Pneumococcal infections have a better prognosis than streptococci, and empyema due to the streptococcus is apt to appear relatively early during the height of the illness and toxæmia due to the lung infection. It is especially apt to be associated with small scattered abscesses beneath the pleura. The distinction between metapneumonic and synpneumonic empyema has an important

bearing on treatment. Open operation with resection of rib gives satisfactory results with metapneumonic empyema at any age, but has a very high mortality in synpneumonic empyema during the first two years of life. Metapneumonic empyema should be dealt with by resection of rib as speedily as possible, but synpneumonic empyema should not be subjected to resection until the pneumonic process has ended. Paracentesis should be used as a temporary measure.

H. S. Souttar's³ statistics from the London Hospital (*Figs. 7, 8*), also show the very great mortality in the first two years. Where the child is overwhelmed by a virulent infection, an empyema is simply an incident of grave import, but not the really critical factor. Mortality will inevitably be high, and surgical interference must be limited to relief of the mechanical conditions. When the infection is less virulent and resistance better, there will be time for the formation of adhesions which limit the extent of pleural infection. From the surgical standpoint the formation of adhesions is a factor of the greatest importance, and in this there is a marked contrast between pneumococcal and streptococcal infections. In the former, massive adhesions form, limiting the extent of the empyema and preventing gross collapse of the lung, whereas the streptococcal empyema involves the whole cavity, the lung is grossly compressed, and the mediastinum pushed to the opposite side. As regards operative treatment, empyemata fall into two groups—the adherent and the non-adherent. In the first the best treatment is to open the cavity freely, evacuate the pus, clear out all solid masses of fibrin, and drain by a closed method. In a young child with a soft thorax an intercostal incision will give sufficient access, but in older children resection of rib is more satisfactory. A large tube is inserted at the lowest point of the thorax, either through a fresh incision or through the primary opening. In either event the thorax is carefully closed except for the tube, around which the tissues should fit airtight. The tube projects through the dressing, and is connected with a long rubber tube, the end of which hangs below fluid in a jar on the floor. In the non-adherent form, to open the pleural cavity freely is to court disaster. The safer plan is to relieve pressure by repeated aspiration, perhaps daily for five or six days. When the child remains dangerously ill, a small intercostal incision, with insertion of a closely-fitting tube and aspiration drainage as above, is all that should be attempted. In children under three this is the method of choice. Where the child's condition warrants it, a more complete exploration is better, the pleural cavity being opened as in cases where adhesions are present. Primary closure after emptying the cavity is disappointing and associated with a high mortality.

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ENCEPHALITIS, EPIDEMIC. (See also EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—A. Salisbury McNalty¹ states that from Jan. 1 to Oct. 25, 1924, 4605 cases of epidemic encephalitis were notified in England and Wales. The outbreak of 1924 started in January, and was at first localized in Lancashire, originally in outlying districts and then in more densely populated centres. There were a number of instances in this outbreak of several members of a household being attacked. (See MEDICAL ANNUAL, 1925, p. 130.)

SYMPTOMS AND COMPLICATIONS.—L. Beriel and A. Devic² describe a *peripheral form* of encephalitis in which the virus of the disease appears to attack the motor and sensory peripheral neurons exclusively or in a predominant manner, the affection corresponding to a meningo-radicleo-neuritic process.

The onset may be sudden, or the disease may take a few days to reach its height. When fully developed the affection presents the ordinary phenomena of polyneuritis; but the most striking feature is the widespread character of the paralysis, which often involves the sphincters, the upper limbs, and sometimes even the face. Pressure on the nerves and muscles is generally painful. Lumbar puncture shows that a meningeal reaction is almost invariably present. The prognosis is always favourable, and, in striking contrast with infantile paralysis, recovery is complete.

M. Bernstein³ records a case of the *hemiplegic form* of epidemic encephalitis which was first described by Buzzard and Greenfield in 1919. The patient was a woman, age 36, who presented evidence of an acute infection with loss of vision and alternating periods of restlessness and stupor, followed, after subsidence of the symptoms for four days, by right hemiplegia, from which there was practically a complete recovery.

The possibility of encephalitis being mistaken for *eclampsia* is emphasized by R. Bompiani,⁴ who describes a case in a pregnant woman admitted to hospital with this diagnosis. The urine, however, showed only minute traces of albumin, and no sugar or urobilin. A living fetus of about five months was delivered by anterior hysterotomy. The myoclonic movements ceased after the birth of the child, but returned later. The diagnosis of epidemic encephalitis was confirmed by the supervention of Parkinsonism,

O. Schirmer⁵ reports a case of epidemic encephalitis in a man, age 33, complicated by *trophic changes in the nails* in the form of multiple whitlows involving successively the fifth, fourth, and third fingers of the left hand, and the fifth and fourth fingers of the right. Rapid recovery took place. Unlike the trophic changes occurring in syringomyelia and Morvan's disease, there was no sensory disturbance, nor had there been any vasomotor changes. Another variety of trophic lesion in the form of *perforating ulcer* of the sole is recorded by N. Samaja,⁶ the patient being a man, age 44, suffering from post-encephalitic Parkinsonism. L. Parziali⁷ relates a case of encephalitis in a youth of 18 in whom Parkinsonism developed after a long period of apparent cure, and was accompanied by *bony deformities*, which have not hitherto been described as sequels of epidemic encephalitis. The deformities were localized in the thorax and right foot. In the thorax the upper four ribs were prominent and thickened, while the remainder were retracted; and in the foot the scaphoid, cuboid, and cuneiform were thickened and prominent.

Although attacks of visceral pain in the form of rectal, peritoneal, and appendicular crises are frequent in epidemic encephalitis, *angular attacks*, of which C. Laubry⁸ records a case in a man of 60, and A. Netter⁹ in a man of 62, are exceptional. They probably indicate involvement of the vago-sympathetic system in the encephalitic process. W. Aldren Turner and M. Critchley,¹⁰ who describe seven cases in patients from 15 to 55 years of age, give the following classification of the *respiratory disorders* of epidemic encephalitis: (1) Disorders of the respiratory rate, which includes tachypnoea and bradypnoea. (2) Disorders of the respiratory rhythm, consisting of sighing, apnoeic pauses, Cheyne-Stokes breathing, bigeminal and trigeminal respirations, and breath-holding spells. (3) Respiratory tics, which are particularly common sequelae in children, such as hiccup, yawning, tic-like expiration of air through the nose, and spasmodic cough. Any combination of these groups may be found. The phenomena may occur in the acute stage, as residua, or as remote sequelae. They may be the only after-effect, but are more usually associated with other well-recognized sequelae. The prognosis is grave when the symptoms appear during the acute stage, a larger proportion

of such cases ending fatally. When they occur as sequelæ they persist unchanged for an indefinite period, no treatment being of any avail.

An example of *erythema scarlatiniforme* at the onset of the disease is reported by J. Sabrazès, F. Sainte-Marie, and Baylac,¹¹ who state that the eruptions occurring in epidemic encephalitis may sometimes resemble measles or rubella, or be papular or purpuric as in cerebrospinal fever.

TREATMENT.—L. B. Hohman¹² treated 18 cases showing the post-encephalitic Parkinsonian syndrome with **Hyoscine Hydrobromide**. The average time that had elapsed between the acute attack and the onset of the Parkinsonian syndrome was sixteen months, and in one patient the interval was as long as five years. The average dose was $\frac{1}{100}$ gr. four times a day. In every case objective improvement was noted: in 6 it was slight, in 5 definite, and in 7 marked. The signs of 'marked improvement' were return to work after months of invalidism, and ability to attend to personal wants after being bedridden and helpless. 'Definite improvement' indicated return to work after partial invalidism, and the term 'slight improvement' was applied to some relaxation of the rigidity but not enough to increase the practical efficiency of the individual. The mental improvement was very striking in a number of patients. Hyoscine was tried in other residues of epidemic encephalitis, such as psychoneurotic states, depression and over-talkative states, and behaviour disturbances, but without any effect.

A. J. Hall¹³ has found that the method recommended by Lust of **Intra-muscular Injections of Milk** in small quantities at bedtime has been effective in many cases of insomnia, both in children and adults.

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ENDOCARDITIS. (See also HEART DISEASE, RHEUMATIC; SYPHILIS, CARDIO-VASCULAR.)

J. E. MacIntwine, M.D.

S. E. Boyd Campbell, M.D.

Endocarditis, an incident in many general infections, has not yet reached a stage of final classification based upon the definite recognition of the invading virus. The usual clinical classification of this condition allows us to recognize a definite group of cases variously designated as subacute endocarditis, bacterial endocarditis, or endocarditis lenta.

J. Gracie¹ reports on 30 cases of *subacute infective endocarditis*. Most have occurred in men of robust health and on active service during the war. Statistics show 90 per cent between 10 and 40 years. In this series predisposing causes are shown as: trench fever, 8; dysentery, 5; influenza, 4; pneumonia, 3; wounds, 2; rheumatic fever, 2; enteric fever, 2; starvation, 1; malaria, 4. Two had a positive Wassermann, but they also gave a history respectively of malaria and enteric fever. The author summarizes the essential points in the diagnosis as: (1) Pallor; (2) Clubbing of finger tips; (3) Slight irregular intermittent fever followed by afebrile intervals; (4) Pulse-rate increased; (5) Splenic enlargement; (6) Valvular disease; (7) Signs of embolism. He advocates a more prolonged convalescence and careful supervision of patients after acute illnesses.

Infective Endocarditis in Congenital Heart Disease.—H. E. A. Boldero and D. E. Bedford² say that endocarditis, simple or vegetative, is less common at the pulmonary valves than at any other situation, pulmonary incompetence being the rarest valvular lesion. In 602 cases of infective endocarditis, the

pulmonary valves were involved in 30, an incidence of 5 per cent. In 198 consecutive cases of infective endocarditis from post-mortem records at the Middlesex Hospital, 9 cases showed pulmonary valves affected, or 4.5 per cent. Three of the 9 had congenitally deformed hearts. Apart from congenital malformations, the pulmonary valves are most commonly affected in gonococcal endocarditis and in puerperal or traumatic septicæmias. In 36 cases in the literature, a patent ductus arteriosus was present in 13 cases, a patent ventricular septum in 12, pulmonary stenosis in 7, a patent auricular septum in 6, defects of the pulmonary valves in 2, and stenosis of the conus arteriosus in 2. In patent ductus arteriosus the infective endocarditis often starts at the pulmonary orifice of the patent duct, and the pulmonary valves frequently escape. With defects of the interventricular septum the vegetations are commonly found round the margin of the aperture, spreading to the ventricles, the pulmonary and frequently the aortic cusps being also involved. In the 198 cases none was found associated with mitral stenosis.

Splenic Enlargement in Chronic Cardiac Disease.—The investigations of J. E. Tally and W. H. Lindsey³ on this subject correspond to the accepted conclusions of the infrequency of a demonstrable splenomegaly due to pure stasis alone. They also confirm the expected greater incidence in children. Of 198 adults, 66 had a palpable liver and only 3 a palpable spleen. Of 88 children, the liver was palpable in 38, and the spleen in 5. If a splenomegaly is present in chronic cardiac disease it suggests a recurrent endocarditis.

Endocarditis Lenta.—F. O. Hess,⁴ from a record of 77 cases of endocarditis lenta, as originally described by Schottmüller in 1910, enumerates the symptoms as a very large septic spleen, anæmia, nephritis, tendency to emboli, and nearly always death. Schottmüller still holds the view that these cases are due to the non-hæmolytic *Streptococcus viridans*. Reviewing the suggestion of the mutation of the various streptococci, he accepts the hypothesis that the type of coccus is the result of the reaction of the infected organism. The frequent negative bacteriological results, he believes, are due to the difficulty in culturing the *Str. viridans*, and these negative results he attributes to faulty technique and the use of wrong culture media. He is confirmed in this view by Isaak Krieger-Friedländer, who got *Str. viridans* in 100 per cent of cases of endocarditis lenta by using a special method of culture. While recognizing that the condition may be associated with infection from staphylococci, influenza bacilli, etc., he states that the streptococcus plays a great, but not a decisive, part in endocarditis lenta. During the war, at Coblenz, he only saw 3 cases from 1915 to 1918. War, he thinks, acts only indirectly by reducing the resistance. There are three views as to the apparent increase of the disease: (1) Due to the war; (2) Due to a periodicity of infection; (3) Due to its better recognition. In endocarditis lenta, then, we have to deal with a bacterial disease, mostly caused by streptococci, and distinguished bacteriologically and clinically by a special capacity for reaction, or condition of immunity, in the organism. The disease takes a septic, subacute or slow course, occasionally with recoveries.

Blood examination shows a secondary anæmia. The literature gives the white cells normal or less than normal. He finds that there is usually a leucocytosis, due to a change in the blood-vessels, but that the leucocytosis varies with the site the specimen is taken from. Thus: right ear, 13,662; left ear, 12,697; finger of the right hand, 6898; finger of the left hand, 6714; median vein, 5500. Sometimes there is a marked leucopenia. The author attaches great importance to the vascular endothelial cells, which he states may be 40 per cent in some cases of marked leucocytosis. They are found chiefly in blood from the ear, occasionally in venous, but never in arterial

blood. The first drop of blood should be taken in order to find these cells. He found them in 34 out of 36 cases of endocarditis lenta, but also in the blood from typhoid spots. He thinks that the repeated finding of these cells is of diagnostic importance, and that they indicate a definite specific endothelial reaction. This vascular change accounts for many signs, such as petechiæ, retinal, renal, and cerebral hæmorrhages, etc., which were previously described as of embolic origin.

He found no connection between old-standing rheumatic endocarditis and endocarditis lenta, and Lubarsch also says there is no close relationship between rheumatic fever and this disease, and states that the blood infarct in endocarditis lenta is produced by a process of sterilization. As 30 per cent of Hess's cases showed brain involvement post mortem, the importance of cerebral symptomatology, with occurrence of aneurysm and purulent meningitis, is emphasized. Renal changes are also commonly found, and are usually associated with a normal blood-pressure, a fact which is considered to be of diagnostic importance. He has seen hæmolytic streptococcus infection with purulent pericardium become endocarditis lenta. Laempe recorded a case of hæmolytic streptococcus infection followed by *viridans* infection.

TREATMENT.—Hess thinks endocarditis lenta can be prevented by the removal of focal sepsis, but says there is not much therapeutic hope when endocarditis is established. Salicylates or Silver Salvarsan may be used. He saw one case cured after Kollargol therapeutic treatment, but four years later the patient developed a high blood-pressure and chronic nephritis.

A. D. Biggs⁵ discusses the use of Sodium Cacodylate 3 gr. intravenously each day from eight to sixteen weeks. Of the 35 patients so treated the death-rate is given at 51 per cent; whereas in another group of 22 patients not so treated the death-rate was 68 per cent. The author points out that the period of observation of these patients is not long enough to warrant definite conclusions on the merit of this medication.

REFERENCES.—¹*Lancet*, 1924, ii, 795; ²*Ibid.* 747; ³*Jour. Amer. Med. Assoc.* 1924, Aug. 8, 423; ⁴*Münch. med. Woch.* 1925, Feb. 6, 205; ⁵*Arch. of Internal Med.* 1925, March, 402.

ENDOCRINOLOGY. (See under the various glands.)

ENDOMETRIOMA.

W. E. Foithergill, M.D.

Amongst pathological investigations of recent years, few have attracted more attention than those dealing with the origin and course of adenomyoma or endometrioma. The subject was discussed at some length in the MEDICAL ANNUAL for 1923 (p. 18), and in the Volume for 1925 (p. 500) a further paper by Sampson was abstracted which dealt with endometrial implants in cases of cancer of the body of the uterus. Operators were advised to use all care to avoid the forcing of blood containing such implants through the tubes into the peritoneal cavity both during examinations and during operations.

K. Vernon Bailey,¹ in discussing the pathology of pelvic tumours brought about as the result of the invasion of the ovary and various other pelvic structures—by either endometrial or Fallopian tubal epithelium—reviews generally the history of this condition in so far as it can be traced by the occasional report of pelvic conditions similar in character. He classifies these various tumour formations into two types, according to their mode of origin: (1) Endometrial type; and (2) Fallopian-tube type; and indicates their chief distinguishing features as demonstrated by affected ovaries—organs which exhibit the results of the growth and activity of the invading elements to the fullest extent.

Moreover, the life-history of each type can be accurately traced. That of the endometrial type falls into six well-defined stages, all of which can be demonstrated in affected ovaries or uteri. Stage 1 is that of the primary implantation upon the surface of the affected organ of endometrial glands or epithelium and stroma cells. Stage 2 exhibits the modes of commencing invasion of these organs by the misplaced epithelial elements. Stage 3 is a well-defined one which shows the method of advance and proliferation of these elements at the expense of the tissues of the host. Stage 4 is that at which the height of activity of the misplaced tissue is reached or passed—the stage of commencing degeneration of the invading elements. It is visible to the naked eye as a ‘seam’ of chocolate-coloured fluid blood, which stretches for varying distances into the tissues of the ovary and marks the track of invasion of the penetrating endometrium. The chocolate-coloured fluid blood is the long-retained product of menstrual activity of the endometrium, and is composed of blood-corpuscles, blood pigment, degenerated epithelial cells, phagocytes, and cellular debris. Microscopically the invading endometrium is always found in connection with the deepest part of the ‘chocolate seam’, and is seen to be undergoing degenerative change. Stage 5 is that of commencing cavity formation in the ovary itself, and Stage 6, which represents the last stage in the life-history of endometrial invasion of the ovary, is evidenced by the production of a totally disorganized organ which may be distended to a great degree by the combined effects of excavation and physiological activity on the part of the misplaced tissue.

The stages in the life-history of the endometrial type of this growth are thus brought about by a process of pure invasion of the affected organ (e.g., ovary) by the misplaced endometrium. Excavation is commenced, with consequent cavity formation. The terms ‘chocolate cyst’, ‘haemorrhagic cyst’, used by authors hitherto, are erroneous. ‘A blood cavity’ is produced in the ovary by this process of excavation. There is no cyst wall produced by the activity of the foreign elements. He believes that the ovary becomes adherent to neighbouring structures during Stage 2, when slight haemorrhagic erosion has taken place on its surface. The ovary is, therefore, adherent at a very early stage in the life-history of the tumour, and remains so during the growth of it. There is no ‘perforation’ of the ‘cyst’, as described by Sampson and others. The mouth of the blood cavity is formed at the commencement of the growth inwards of the endometrial tissue, and the ‘site of perforation’ mentioned in literature is the cavity-mouth, which is always found glued to some neighbouring structure.

Pathologically constant but less typical is the mode of invasion of the uterus itself by endometrium from without. This process falls into three definite stages, similar to those exhibited by affected ovaries, but possessing distinct histological features, which can nevertheless be associated with corresponding stages in ovarian tumours concerned with this condition. The writer also demonstrates the effect of endometrial invasion of the Fallopian tube and various pelvic ligaments.

Similarly the life-history of the Fallopian type can be shown to pass through four well-defined stages. In all these it is seen to be less active, less invasive, and less virulent than the endometrial type. The distinctions are chiefly histological in character, but the process, though milder, is exactly the same—a primary implantation on the surface of the ovary of epithelium identical with that which lines the plicæ of the normal Fallopian tube, which invades the tissues of the host, proliferating during its active phases, and eventually degenerating in the last stages of the tumour formation.

In demonstrating the etiology of this pelvic condition, the author asserts

at once that in both types of this pelvic tumour he believes that the primary deposit on the ovarian surface (or any other surface) is brought about by the 'shedding' on to it of endometrial or Fallopian tubal epithelium, emanating from the uterine cavity or Fallopian tubal lumen respectively, as the result of a process of regurgitant menstruation or back-flow through the tubes, by which elements of this nature are eventually expelled via the abdominal ostium of the Fallopian tube and deposited on the surfaces of the various pelvic organs. To prove this assertion he examined the uterine cavity and the lumen of the interstitial, isthmie, ampullary, and fimbrial portions of the Fallopian tube in undamaged specimens of pelvic organs affected by this tumour and removed during menstruation. In these he demonstrated the presence of free blood and epithelial elements, the only possible source of which could have been from the uterine cavity itself. He includes photographs to show the general appearance of the female pelvic organs associated with this condition, and also some of the stages in its life-history; several of these are reproduced here (*Plates VII-X*).

In discussion, many interesting points have been brought forward with regard to the phenomenon of regurgitant menstruation, which he believes to be one of far greater frequency than is at present supposed, and much interest has been taken in the question of malignancy associated with these growths. Also the exciting factor to invasiveness on the part of these misplaced elements is as yet in doubt, although he believes it to be brought about by the preparatory action of an irritative uterine secretion, expelled along with the cellular elements, in devitalizing and thus preparing the chosen pelvic organs. The question also of the cure of this disease is, he points out, one which must remain in doubt so long as the cause cannot be adequately dealt with. All these questions must form the subject of further research before the completion of a thorough understanding of this most interesting pelvic condition can be reached.

REFERENCE.—*Jour. Obst. and Gynaecol. Brit. Emp.* 1924, xxxi, 539. (See also *Medical Annual*, 1923, p. 18, and 1925, p. 500.)

EPIDERMOLYSIS BULLOSA.

E. Graham Little, M.P., M.D., F.R.C.P.

Engman and Mook¹ produced evidence for their view that this disease is due to a congenital absence of elastic tissue, and T. J. Calhoun and W. P. Brown² confirm this observation in their report of a new case of this rare condition. This occurred in a coloured girl, age 11, with no familial history of the disorder, but very early onset of the symptoms. Histological examination showed defect of elastic tissue in the upper and papillary portions of the corium.

REFERENCES.—¹*Jour. Cutan. Dis.* 1910, 276; ²*Arch. of Dermatol. and Syph.* 1925, Feb., 183.

EPILEPSY.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

In a discussion on the nature and treatment of epilepsy, Collier¹ read a lucid and luminous paper from which several points are here extracted. The symptoms of epilepsy have been familiar to physicians since the days of Hippocrates, and little has been added in the way of clinical phenomena, although of recent years certain types of epilepsy have been separated, chiefly as regards prognosis and treatment, notably such varieties as 'pyknolepsy' and 'myoclonus epilepsy'. *Pyknolepsy* is a peculiar form of minor epilepsy of good prognosis, occasionally met with in children between the ages of 4 and 12 years. It usually reaches its maximum severity at once. The symptoms consist in numerous slight attacks of minor epilepsy of uniform mildness, recurring daily for weeks,

PLATE VII.
ENDOMETRIOMA
(K. VERNON HALEY)



Fig. 4.—Uterus and appendages—posterior view. A typical case of the endometrial type, showing an advanced stage. The uterus is stony, with dense adhesions posteriorly. The right ovary is transformed into a distended sac filled with chocolate-coloured fluid blood; the thinned-out and compressed ovarian stroma forming the walls. It was densely adherent to the base of the broad ligament at the aperture of the cavity shown. The left ovary is not affected.

Plates VII—X kindly lent by "The Journal of Obstetrics and Gynaecology of the British Empire

PLATE VIII.

ENDOMETRIOMA—*continued*

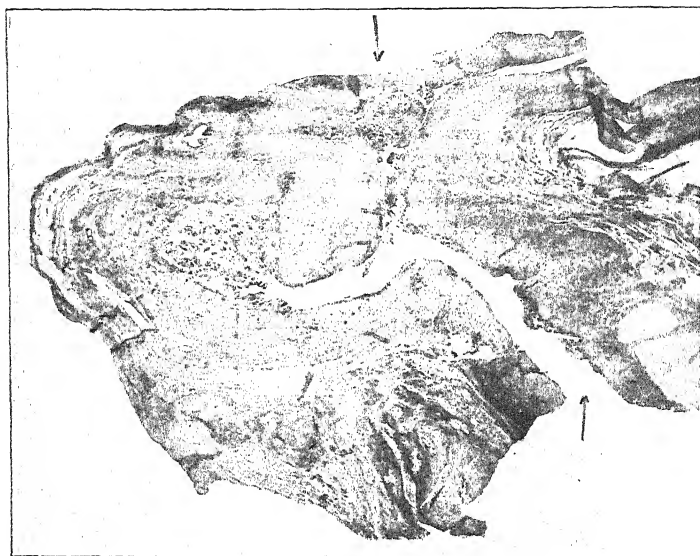


Fig. B.—Right ovary. Showing narrow channel of invading endometrium, with terminating clumps of actively penetrating endometrium.

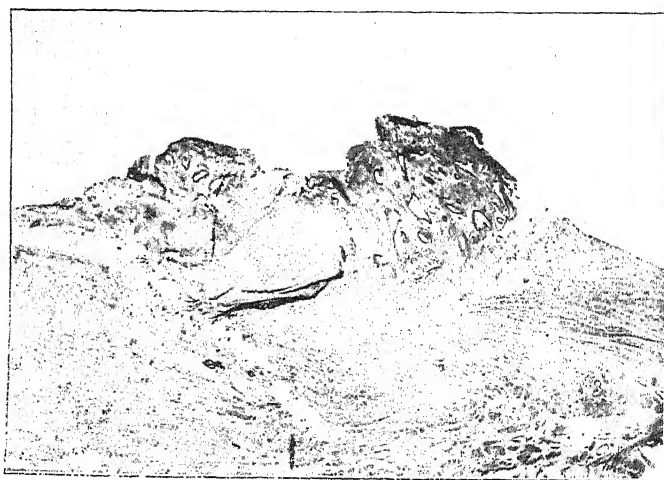


Fig. C.—Early deposit of typical endometrium on the serous surface of the uterine body.

PLATE IX.

ENDOMETRIOMA—*continued*



Fig. D.—Right ovary, low power. Two small endometrial gland spaces in fine fibrin network, with scattered endometrial stroma cells situated on the surface of the ovary. Invasion has not yet commenced.

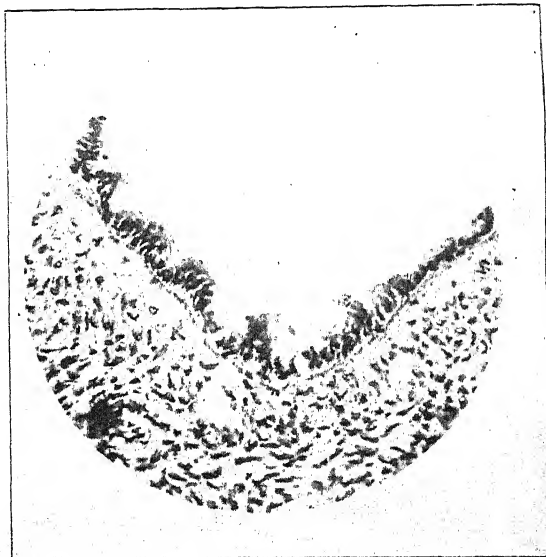


Fig. E.—Right ovary of another case—high power. Stage 2, showing early indentation of the ovarian surface by Fallopian epithelial cells.

PLATE X.

ENDOMETRIOMA--continued

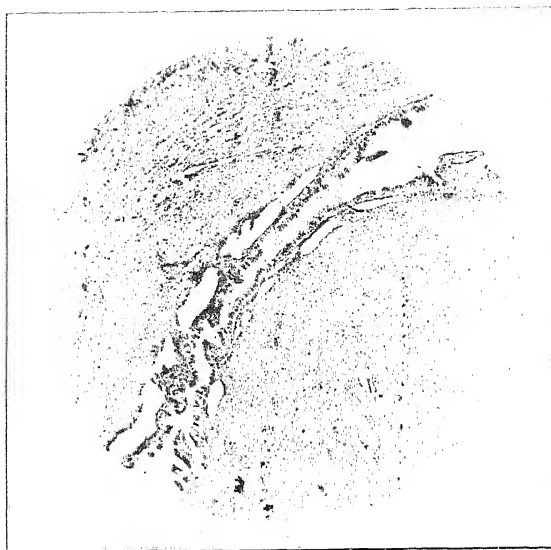


Fig. F.—Interstitial portion of Fallopian tube. Blood lying free in the tubal lumen. Not derived by diapedesis from surrounding vessels or spaces.



Fig. G.—Fimbrial end of Fallopian tube in another case. Menstrual blood and loose epithelium in tubal lumen.

months, or years, varying in number from six or seven to a hundred or more in a day. There is nothing in the individual attack to distinguish it from ordinary petit mal. These attacks are singularly resistant to medicinal treatment, but ultimately they cease spontaneously at or after puberty, leaving no trace behind. *Myoclonus epilepsy* is a term applied to cases of epilepsy in which simple muscular twitchings occur from time to time apart from the epileptic attacks and without any other mental or bodily disturbance.

As to the pathology of epilepsy, it is well recognized that in the human subject exogenous poisons, such as lead, bismuth, and absinthe, together with endogenous poisons and metabolic dyscrasias, such as those occurring in rickets, in renal disease, in hepatic disease, in puerperal eclampsia, and in pituitary and thyroid disease, are all capable of producing symptoms indistinguishable from those of epilepsy. More than this, every one of these conditions has proved capable of inducing an established and recurring type of epileptic fits, even when the original exciting cause has ceased to exist. These and other facts are strong evidence in favour of the view that the cause of epilepsy is not any condition of cerebral instability, irritability, or habit, but rather a metabolic disturbance. The periodicity of epileptic fits—the occurrence of types sometimes exclusively nocturnal, sometimes diurnal, or sometimes occurring only at the menstrual epochs—is also strongly in favour of a metabolic disorder. Further, the common cessation of epileptic fits during pregnancy, or again their occurrence only when the patient is pregnant, can best be attributed to a metabolic disorder.

Miller² has recently emphasized the hypothesis that epilepsy, like migraine, may be a sensitization disease. The efficacy of Protein Therapy in some patients is evidence in favour of this. For example, it has been reported by French physicians that after antitoxin treatment for rabies, or for diphtheria, epileptic seizures have temporarily disappeared. Bouché and Houstin,³ following this line, treated a number of epileptics with Normal Horse-serum with encouraging results. Held⁴ in 1920 reported on a series of 400 cases of epilepsy treated by the injection of serum from animals previously injected with the serum and cerebrospinal fluid from epileptics; he states that 18 per cent of his series had been free from seizures for two to four years, and that only 39 per cent were not benefited. If there is any value in this treatment, it is most probably due to the effect of normal serum rather than to changes produced by previous treatment of the animals. Other observations suggest that foreign protein injections can modify epilepsy. Crockett⁵ conducted a tuberculosis sanatorium where all the patients received tuberculin. He observed that if the patient happened to be epileptic the seizures often disappeared. He then treated 23 cases of epilepsy with Tuberculin injections, beginning with minimal doses and gradually increasing the strength for 8 or 10 injections at intervals of about a week, always endeavouring to avoid a febrile reaction. Eleven of his 23 patients, at the time his report was published, had been free from seizure for three months or more. One patient who had had 309 major and minor seizures in the month preceding the treatment had been entirely free for nineteen months. Similar evidence is adduced by Edgeworth,⁶ who treated 20 epileptics with intravenous injections of a 5 per cent Peptone solution, beginning with 5 min. and gradually increasing to 29 min. Nine of his patients had been at least temporarily benefited.

If from the foregoing we deduce that the epileptic seizure is an anaphylactic manifestation, the question of possible *specific desensitization* becomes of practical importance. The rôle played by individual articles of food in the production of epilepsy is not very convincing, although from protein skin tests by Wallis and Nicol,⁷ it seems probable that in patients who are sensitive to

a particular food the withdrawal of that article from the diet may cause disappearance of the seizures, with a recurrence in case the offending food is taken again. There is also considerable evidence that there is a *non-specific desensitization* attainable in asthma and hay-fever, and the same thing may yet prove true of epilepsy. Status epilepticus is most readily explicable on the grounds of an acute toxic process; it closely resembles experimental convulsions from the administration of poisons, and is akin to eclamptic and uræmic convulsions. Finally, Collier points out that only a very small proportion of gross injuries to the cerebral hemispheres are followed by epilepsy. From the infrequency and irregularity of the incidence of epilepsy in lesions of the brain, it would seem that it is not the lesion itself which causes the epilepsy, but that it is due to some associated condition not necessarily present with every lesion.

An important principle in cerebral pathology is that cerebral inhibition and not cerebral excitation is the initial event in the epileptic attack. Hartenberg, in 1919, enunciated this as a new maxim, probably unaware that we in England, since the teaching of Hughlings Jackson, have recognized this as the most probable mechanism. When the cerebral inhibition is slight and of short duration, there is merely momentary loss of consciousness, as in petit mal. When it is more severe the patient falls in his attack; when still more severe the lower centres are released from control and convulsion appears.

TREATMENT.—Hygienic measures are always important in epilepsy, but the less one departs from the routine of a normal healthy life, and the fewer restrictions one makes, the better for the patient. Children and adolescents should, whenever possible, continue with their ordinary education, with normal discipline, games, and pleasures, with only those restrictions necessary to safeguard the patient and to ensure the peace of mind of his parents. Occupation is good for every epileptic. It is the only thing which does some of them any good. Fits are infrequent in any epileptic whose mind or body is at a high level of physiological activity. Apart from general hygienic principles, Collier does not find that any particular dietetic régime has a special effect on the course of the disease. The exclusion of meat, the purin-free diet, the ketogenic or high fat diet, the salt-free diet, and even treatment by fasting or starvation, have been extensively tried, but in Collier's opinion without bringing conviction as to their utility. Alcohol, however, should be forbidden to the epileptic. The correction of bodily abnormalities, such as dyspepsia and constipation, intestinal stasis, uterine disorders, etc., whilst always desirable, should not lead us to neglect the essential treatment of the epilepsy.

As regards drugs, the introduction of the malonyl-urea compounds, including **Luminal** and **Gardenal**, marks the most important advance in the treatment of epilepsy since the introduction of **Bromides** by Laycock in 1857. These newer remedies are potent and well tolerated by the patient, and they can be advantageously combined with or alternated with the bromides. Nor is it necessary or even prudent to employ them in large doses. The medicinal remedies for the prevention of epileptic fits, whatever their nature, do not act, as is too often supposed, by lowering the excitability of the nervous system (which, as we have seen, is in a state not of excitation but of inhibition), but by influencing the metabolic dyscrasia, the toxic process, or whatever it may be, which is the fundamental cause of epilepsy. This condition of metabolic dyscrasia, this anaphylactic condition, is not constantly present in the epileptic; sometimes it is absent for long periods. In the nocturnal epileptic, for example, it is absent in the daytime. Hence, whenever one can anticipate the attack with medicinal remedies, one has a better result. Thus in nocturnal epilepsy it is best to give only a single dose at bedtime; in diurnal epilepsy, a single dose

in the morning; and in epilepsy which occurs both by day and by night, a dose night and morning. Collier has a preference for luminal as the morning remedy and for bromide at night. He never gives larger doses than 25 gr. of bromide or $1\frac{1}{2}$ gr. of luminal, and not often such large doses as these.

In the treatment of *status epilepticus*, the time-honoured method has been to administer large doses of bromide and chloral per rectum, to give hyoscyne hypodermically and chloroform by inhalation. But in view of the high mortality of status epilepticus, a condition which is often associated with hyperpyrexia and in which acute fatty changes in the heart muscle are practically constant, it is found that **Morphine** is by far the best and most rapid means of checking the convulsions, meanwhile sustaining the patient's strength with easily absorbable liquid food, carefully administered by nasal tube. To this, in severe cases, alcohol may be added.

Grainger Stewart, in the course of the discussion, considered that the cause of epilepsy might eventually be found to concern the vegetative nervous system. He called to memory the type of epileptic patient with greasy, blotchy skin and offensive perspiration in whom the administration of tincture of **Belladonna** (20 min. thrice daily) leads to a cessation of the fits and remarkable improvement in the general health.

Brilliant as have been the results by treatment with luminal, or phenyl-ethyl-malonyl-urea, Maillard and Renard³, of the Bicêtre Hospital, have continued to search for a drug which, whilst possessing the anti-epileptic efficacy of luminal, and, like luminal, derived from malonyl-urea, shall be even less toxic. Such a drug they claim to have found in **Rutonal**, or phenyl-methyl-malonyl-urea. Various experiments led them to the conclusion that the radicle phenyl must be present; otherwise the anti-epileptic action is lost (as, for example, in veronal, which is di-ethyl-malonyl-urea). Retaining therefore the phenyl element, they substituted for the second radicle ethyl the radicle methyl, and obtained rutonal as above described. This substance, equally efficacious as luminal as regards epilepsy, is less toxic. Its action is somewhat less rapid, and it takes usually three or four days to show evident effects, as compared with one or two days in the case of luminal. They give particulars of 81 unselected cases of epilepsy, and claim that the results are just as satisfactory as by luminal treatment, and that, in cases where luminal is badly tolerated, rutonal can be given instead. In the adult they begin with a total daily dose of 30 cgrm., or 5 gr., and gradually raise this to a maximal daily amount of 40 to 70 cgrm., i.e., 6 to $10\frac{1}{2}$ gr. After the seizures have been absent for several months, the doses may be slowly and gradually reduced. It will be noted that these doses are higher than we find necessary in the case of luminal, but it is useful to have it at our disposal in cases where luminal is badly tolerated, e.g., where luminal produces excitement. Like luminal, rutonal is free from the dulling effects of bromide in epilepsy, both as regards intelligence and memory. They mention one or two minor drawbacks of rutonal. Firstly, it may produce a slightly itchy papular eruption on the face, neck, and upper limbs, but this disappears spontaneously in a few days or weeks, and does not recur. Secondly, in a few cases the patient under rutonal or luminal treatment complains of lumbar or interseapular pains, occurring two or three months after starting the treatment. These may sometimes be so severe that the luminal or rutonal has to be given up and replaced by the bromide, so that the unfortunate patient redevelops his epileptic fits.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 1045; ²*Amer. Jour. Med. Sci.* 1924, Nov., 635; ³Ref. by Tincl, *La Médecine*, 1922, 366; ⁴*Neurol. Centralb.* 1920, 394; ⁵*Brit. Med. Jour.* 1921, i, 458; ⁶*Ibid.* 1920, ii, 780; ⁷*Lancet*, 1923, i, 741; ⁸*Presse méd.* 1925, March 11, 315.

EPITHELIOMA ADENOIDES CYSTICUM.

E. Graham Little, M.P., M.D., F.R.C.P.

H. M. Perry and F. C. Doble¹ describe a very curious case of this affection in a young man of 25, in whom a generalized eruption of pearly-white nodules covered the forehead and the skin behind the ears, on either side of the alæ nasi (*Plate XI*), on the nape, and shoulder-blade. At least 200 nodules were present. The history negatived any family disease; and the patient had not noticed any eruption prior to three years before the date of his being seen. The histological examination showed typical features of epithelioma adenoides cysticum.

REFERENCE.—¹*Jour. R.A.M.C.*, 1925, March, 161.

ERYSIPELAS.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—A. Tata¹ reports on a case in a boy, age 10, of *appyrexial erysipelas*, which presented all the characteristic features of facial erysipelas, but without any rise of temperature or any cerebral symptoms. Complete recovery took place in the course of ten days under local applications of Guaiacal Oil and injections of Colloidal Preparations.

A. Mathias² describes three forms of *nephritis* occurring in erysipelas, viz., an albuminuric, a hæmaturic, and a hyperacute form. The albuminuric form is frequent even in cases of moderate intensity. Symptoms are entirely absent apart from a slight diminution of diuresis and a trace of albumin in the urine. The hæmaturic form of nephritis is usually found in association with severe erysipelas, but it may occur in convalescence irrespective of the character of the attack. The hyperacute form, which is less frequent than either of the others, is generally found in erysipelas associated with hyperpyrexia. Death from anuria usually takes place in one or two days.

C. Macfie Campbell and M. E. Morse³ report a case of *Westphal-Strümpell pseudo-sclerosis* following facial erysipelas in a man of 47. The symptoms were general mental impairment, tremor, monotonous speech, and episodes of somnolence and stupor. The diagnosis was confirmed by the necropsy, which showed diffuse degenerative changes in the nerve-cells of the cortex, mid-brain, and pons, partial degeneration in the pyramidal tracts of the dorsal and lumbar regions, and nodular cirrhosis of the liver.

TREATMENT.—J. H. Jackson and J. Johnston⁴ record 17 cases treated by intravenous injection of 1 per cent solution of *Mercurochrome-220* in doses ranging from 20 to 40 c.c. according to the patient's weight. The drug should not be used as a routine measure, but is indicated in able-bodied patients with no kidney involvement, in recurrent cases, and in severe forms.

REFERENCES.—¹*Studium*, 1925, 22; ²*Thèse de Paris*, 1924, No. 231; ³*Jour. Neurol. and Psychopathol.* 1924, v, 28; ⁴*Therap. Gazette*, 1924, xlviii, 343.

ERYTHRÆMIA.

Ivor J. Davies, M.D.

T. B. Fletcher,¹ of Baltimore, has put on record an analysis of the clinical aspect of 32 cases of erythremia from the wards of Johns Hopkins Hospital. The disease is also known as Osler's disease, Vaquez's disease, and as polycythæmia vera.

"The affection is most often mistaken for hypertension, chronic Bright's, arteriosclerosis, apoplexy, neurasthenic states, and eye affections, which are merely associated manifestations or complications of the disease". Fletcher rightly emphasizes the latter group of affections, so commonly seen in practice, as being important in differential diagnosis. Perhaps further emphasis should have been laid on emphysema, an important cause of secondary polycythæmia, as being responsible sometimes for failure to detect the presence of the true

PLATE XI.

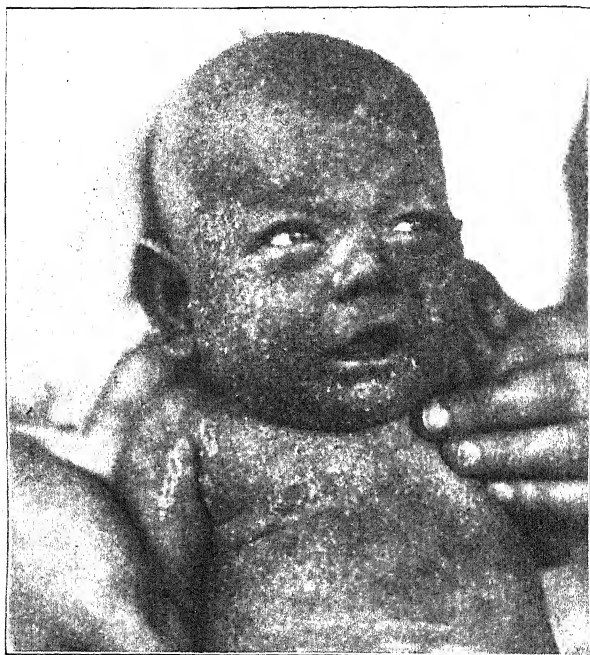
EPITHELIOMA ADENOIDES CYSTICUM



*By kind permission of the
' Journal of the Royal Army Medical Corps*

PLATE XII.

CONGENITAL ICHTHYOSIFORM ERYTHRODERMIA



*By kind permission of the
'Archives of Dermatology and Syphilology'*

affection. Breathlessness is more a feature of emphysema than is cyanosis, whose presence should suggest a complete blood examination, and more particularly if the cyanosis be of a cherry-red tint, with numerous visible venules on the face and mucous membrane of the mouth and fauces. Males were affected more than three times as often as females in Fletcher's series. One case only out of the 32 occurred in the coloured community. Two-thirds of the cases were between 31 and 50 years of age.

SYMPTOMATOLOGY.—Headache, dizziness (emphasized by Osler), with a sensation of fullness in the head, and sometimes with tinnitus, were frequent early symptoms. A transitory weakness of one or the other extremity, especially if hypertension were present, frequently led to an incorrect diagnosis of primary arteriosclerosis. Constipation was a prominent feature in a majority. Evidence of arteriosclerosis was frequent, with enlargement of the heart, and a relative mitral incompetence was generally associated. Cerebral thrombosis with hemiplegia occurred in 6 cases. Albuminuria was present in every case, and definite evidence of chronic nephritis in 21. Hæmorrhages, as hæmoptysis, hæmatemesis, hæmaturia, not infrequently occurred.

PHYSICAL SIGNS.—(1) Cyanosis of the face and hands, usually of a cherry-red colour, from venous dilatation, which as a rule was obvious on the face, lips, buccal mucous membrane, and also in the fundus oculi. (2) Splenomegaly was present in 19 cases, and varied in degree from being just perceptible to a considerable enlargement. (3) Moderate enlargement of the liver was present in some of the cases. (4) *Polycythæmia*. The average red-cell count was close on 9,000,000 per c.mm., the highest being over 13,000,000. Hæmoglobin was on an average 124 per cent, and colour index 0.7. A considerable leucocytosis, with slight increase of the polymorphonuclear cells, was frequent. The blood-platelets as a rule were moderately increased. Anæmia with further enlargement of the spleen and a leukæmic blood picture may supervene, as in 3 cases recorded by Minot and Buckman.²

COURSE.—The disease is ultimately fatal from intercurrent disease, and generally from vascular lesions.

TREATMENT.—This is palliative only. Venesection with repeated removal of from 500 to 800 c.c. of blood almost invariably gave relief, and may cause a considerable diminution of the cell-count. Benzol is well worth a trial, and may have a striking effect on the blood-count. The leucocyte count should be carefully watched to avoid a marked leucopenia. *Phenylhydrazine Hydrochloride*, as advocated by Eppinger and Kloss,³ is worthy of trial, for this drug probably causes an increased red-cell distribution. It is given by the mouth in doses of 0.1 to 0.3 grm. daily, or hypodermically in a 1 to 5 per cent solution and 1 to 10 c.c., for one daily dose at intervals of one to three or four days. Fletcher advises a discontinuance of the drug before the count reaches the normal, as the drop continues for some time after its withdrawal.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1924, Aug. 14, 304; ²*Amer. Jour. Med. Sci.* 1923, clxvi, 469; ³*Therap. Monats.* 1918, 322.

ERYTHRODERMIA, CONGENITAL ICHTHYOSIFORM.

E. Graham Little, M.P., M.D., F.R.C.P.

U. J. Wile¹ has observed three cases of this rare disease, in a family where remarkable breeding-in seems to have taken place for two generations. The pedigree is reproduced below (*Fig. 9*). All the affected children showed the same condition. They were marasmic and undersized. There was superficial exfoliation all over the body, the face, and head, so that a strong resemblance to the peeling stage of scarlet fever was produced (*Plate XII*). The exfoliation is not continuous, some areas being left free. The skin under recently

exfoliated patches remains red for a few hours, then becomes normal in colour, and thereupon again peels off, and this cycle is renewed indefinitely. There was distressing pruritus in all three cases, and one of the children died within eleven weeks of birth. Blood was normal, Wassermann negative. Histological sections showed certain differences from the usual picture of congenital

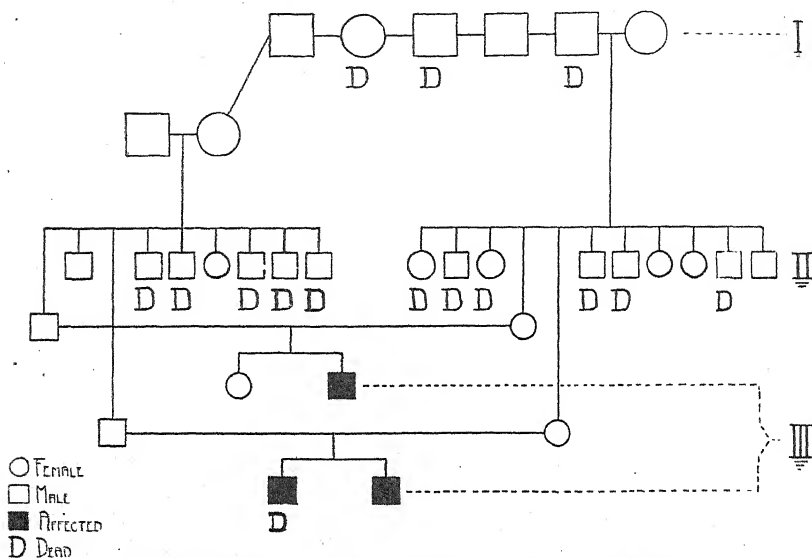


Fig. 9.—Pedigree in a case of congenital ichthyosiform erythrodermia.
 (Kindly lent by the 'Archives of Dermatology and Syphilology'.)

ichthyosiform erythrodermia. There was no hyperkeratosis, the stratum corneum being conspicuously thin, but there was marked acanthosis. There was, further, a notable diminution of elastic fibres. It is to be noted that the three children were males.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Oct., 487.

ERYTHREDEMA (Swift).

E. Graham Little, M.P., M.D., F.R.C.P.

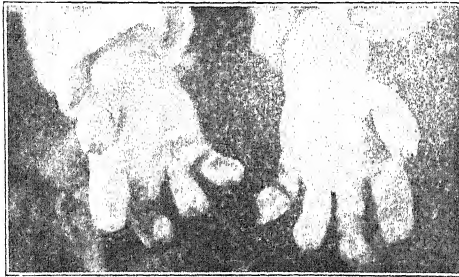
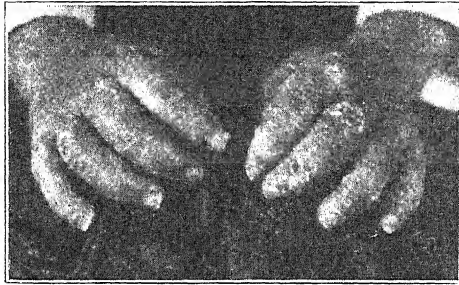
† J. Butler¹ reports under this heading a case of a boy, age 5, who was irritable, restless, and drowsy, suffering from intense itching of the body, hands, and feet, with profuse sweating, and a miliary rash on the body, swollen hands and feet (Plate XIII), and pain in the legs and feet, with inability to walk. Loss of hair, photophobia, and anorexia completed a picture of general illness. The condition is known in Australia and the States under the popular designation of 'pink disease', and some cases have probably been described under the name 'acrodynia', although this title covers some cases which are not, in Butler's opinion, of this type, and he prefers the name given by Swift, of Adelaide, who reported the first case in 1914. The disorder was fully described in the *MEDICAL ANNUAL*, 1924, p. 167, to which the reader is referred.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1925, Feb., 168.

EXTRASYSTOLES. (See HEART, ARRHYTHMIA OF.)

PLATE XIII.

ERYTHROEDEMA



*By kind permission of the
'Archives of Dermatology and Syphilology'*

EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.

Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)

Ocular Disturbances in Functional Inefficiency of the Kidney.—This article by A. M. Ramsay¹ will amply repay reading. The pathogenesis of glaucoma is closely related to perverted metabolism and inadequate elimination. There should be not only a proper supply of suitable food and fresh air, but a thorough elimination of waste products, if health is to be maintained. Ramsay says no chemical test applied to the urine gives an indication of the early stages of renal insufficiency. The toxin sought for is not in the urine. It has been kept back, and in the blood eludes the most diligent search. Any tests that have been proposed can be passed successfully by a kidney which, to clinical observation, is manifestly unable to cope with the demands being made on it. The patient, however, 'feels' that there is something wrong. How can the functional activity of the kidney be determined? The only person who can supply the information is the patient himself. Briefly, he cannot eat what he formerly could, gets a headache, digestion is easily upset, gets easily tired. The urine shows no gross pathological change, but the specific gravity is persistently at a lower level than normal. Many patients in this condition are referred by physicians to the oculist because of headaches. They complain that the headache is always worse in the morning on waking from sleep, and that they suffer from glare and sometimes from flashing lights when they expose the eyes to bright lights, and more particularly if they try to *sew* or *read by electric light*. The ophthalmoscopic picture is characteristic. The fundus is abnormally red, retinal veins are prominent and rough in outline. The light reflex from the arteries is more brilliant than usual, the smaller branches are inclined to be tortuous, and white lines sometimes accompany the vessels as they traverse the disc. There is a want of brilliancy of the fundus, the result of congestion of the capillaries of the retina. The optic disc is well defined in outline, but of rose-red colour, and the macula is, as a rule, very easily seen. The patients complain, as a rule, not only of headache, but of many symptoms of defective elimination usually ascribed to functional derangement of the liver. In these circumstances a course of eliminative treatment is required, as well as glasses, to relieve the symptoms.

Toxic amblyopia is usually attributed to the abuse of tobacco and alcohol, but identical symptoms occur in those who have been life-long abstainers from both alcohol and tobacco. Nicotine and alcohol, though not the direct cause of failing sight, contribute to it, by inducing chemical changes, with the result that waste products accumulate in the blood more rapidly than they can be eliminated. The reason why the papillomacular bundle is affected, which causes the typical central scotoma for red and green, etc., is because it is very specially supplied with blood through a capillary meshwork. If the blood contains toxic products, it will act most injuriously on parts most abundantly supplied with capillaries, which consequently will be the first to show signs of nutritional disorder. If these patients are interrogated, the majority will admit that, before the vision began to fail, they had suffered from flatulence, palpitations, breathlessness, or general nervousness. The complexion often presents a dirty pallor, veiled by lividity. The output of urine is low, with no corresponding increase of specific gravity. Iritis and iridocyclitis may occur as a result of faulty elimination of waste products in the urine.

A failure of sight may be the first indication of a general arteriosclerosis. A case is quoted of a man who complained of his sight failing. He had had perfect health up till then. Six months later he was dead as the result of general arteriosclerosis. [The reviewer's experience agrees with that of Ramsay in general. He has seen many cases in which a patient has come

'just for a change of glasses' in which arteriosclerotic retinitis has been present, absolutely unexpected. One was a case of a surgeon who thought he was in perfect health, but who died of cerebral hæmorrhage six months later. Such cases emphasize the need for a close examination of the fundus oculi before ordering glasses. If this is not done, sooner or later such a case will escape notice.—A. E. J. L.]

Acute Leukæmia with Exudation into the Anterior Chambers.—Avimer² reports an interesting case of acute leukæmia, in which a condition resembling hypopyon was seen in the anterior chambers. It was bluish-white in colour, but more mobile than the usual purulent exudates. During active movements of the child, it spread out over the iris and the anterior surface of the lens. No inflammatory reaction or photophobia was present. The pupils were unequally contracted, and the pupillary reflex was abolished. Paracentesis of the anterior chamber and examination of the exudate showed it to be sterile. It consisted chiefly of white cells, especially large mononuclears, chiefly of the basophil variety, and filaments of fibrin. Examination of the cerebrospinal fluid and of the blood showed also a large number of basophil large mononuclears. The author can find records of no similar case.

Diplopia in Encephalitis Lethargica.—E. R. Chambers³ reports, as typical of many similar cases seen during a recent epidemic of encephalitis lethargica, one of a girl, age 19. For two days she suffered with giddiness and headache. On the third day she awoke with diplopia. It was very troublesome when looking at far objects, but was hardly present at all in near vision. The temperature was 101°. There was no history of recent illness. Movements of both eyes, fundi, and optic discs were all normal. The diplopia disappeared in a week, and the patient appeared to recover completely. In some cases a divergence ultimately developed. Chambers quotes four similar cases from the literature, and concludes that they were due to a paralysis of divergence. It is remarkable that in this epidemic these cases were extremely common, whereas other writers describe them as of rare occurrence.

Ocular Complications in Diabetes.—C. L. Andersen⁴ says authors differ widely in their statements as to the frequency with which ocular complications occur in diabetes. It appears, taking a rough average of different observers, to run from 10 to 25 per cent. In a series of 292 cases, he found 82, or 28 per cent, with eye complications. Of these, 42 showed retinal complications, 13 diabetic cataract, and 12 transitory refractive errors. His experience leads him to the conclusion that such complications are more frequent than is usually supposed.

W. S. Duke-Elder⁵ reports three cases in which *changes of refraction* occurred in diabetes. With high or increasing sugar, *myopia* tends to occur; with decreasing sugar, and therefore just after the onset of energetic treatment, *hypermetropia* tends to occur. The phenomenon is due to osmotic processes, involving the lens, caused by a variation of the molecular concentration of the blood and tissue fluids with the sugar content. In both cases the tendency is to recovery. In one case, a patient whose vision was formerly quite normal, = $\frac{6}{6}$ in each eye, three days after being put on a strict diet woke up saying she had 'gone blind'. She had developed hypermetropia in one eye, in one axis, to the extent of 9 dioptres, in the other 7.5 dioptres. [It is well that the practitioner should know of such cases. The reviewer recently had such a case under his care, in which 4 dioptres of hypermetropia developed suddenly, causing very great distress to the patient. The ordering of appropriate glasses afforded her much relief, as she thought she was going blind also. After a holiday, her sight returned to normal from $\frac{6}{6}$ in a couple of days or so. The amount of hypermetropia in this case was carefully measured twice under homatropine.—A. E. J. L.]

Eye Symptoms in Myasthenia Gravis.—It is well to remember that eye symptoms may be among the earliest which occur in myasthenia gravis. Thus, in a case described by A. H. Douthwaite,⁶ one of the earliest signs noticed was bilateral ptosis which followed a transient attack of abdominal pain and nausea, attributed to eating bad fish. Transitory diplopia occurred about the same time. Nine years afterwards he had frequent attacks of diplopia, which a year later became permanent. It was remarked that it was less noticeable in the early morning. Marked ptosis also developed in both eyes. Except for irritability of his muscles, which rose up in a wheal when the extensors of the forearm or thigh were tapped, and some stiffness of the thighs, he remained well for ten years, till the diplopia and more marked other symptoms occurred again, leading him to seek assistance. [It is characteristic of these cases that the ocular symptoms are usually less pronounced in the early morning, when the muscles are not fatigued. Eye symptoms which may be transient and variable in character often occur in *encephalitis lethargica*, and not infrequently are the ones that lead the patient first to seek advice. They have not as a rule this characteristic.—A. E. J. L.]

REFERENCES.—¹*Glasgow Med. Jour.* 1925, April, 208; ²*Ann. d'Oculist.* 1925, March, 203; ³*Brit. Med. Jour.* 1925, i, 507; ⁴*Acta Ophthalmol.* 1924, fasc. iii, 250; ⁵*Brit. Jour. Ophthalmol.* 1925, April, 167; ⁶*Brit. Med. Jour.* 1925, i, 108.

EYE AFFECTIONS, GENERAL. *Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)*

Significance of Ocular Symptoms.—P. Flemming¹ deals with these in detail. Pain in connection with the eyes of sufficient severity to *prevent sleep*, and at the same time associated with disease of the eyes, suggests either iritis, glaucoma, a foreign body, or abrasion of the cornea. In the slighter cases of glaucoma, sleep may not be interfered with. Flemming advises that a record of the size of the pupil should be made before putting in eserine or atropine. In these cases a practitioner may require a second opinion. It is a great help to know the state of the pupil. Small pupil indicates iritis, dilated pupil glaucoma. *Discomfort*, with a feeling of gravel or grit in the eye, indicates mild conjunctivitis. One of the commonest errors is to overlook *spasmodic entropion in elderly patients*. The lashes roll in and irritate the eye. The conjunctivitis is often recognized, but the *cause* is overlooked. It is generally a mistake to attribute *headache* to eye-strain after 50. It is usually supra-orbital, frontal, or at the back of the neck—not in the vertex. It frequently occurs on waking, the explanation being that it is due to excessive accommodation; when the patient wakes, he uses his accommodation in dressing, and so starts off the pain again. It often disappears after breakfast, to reappear in the evening when the eyes are tired.

Flashes of light—if not the aura of migraine—are of serious import. In myopia they may indicate an imminent detachment of the retina, which timely rest might avert, or may be due to that insidious disease cyclitis. These symptoms call for a very thorough examination. *Seeing worse in a bright light* may indicate tobacco neuritis or early optic atrophy; the strong light easily fatigues the already exhausted nerve. A still commoner cause in private practice is a cataract in the line of vision. *Vomiting* may be the symptom which causes a glaucoma patient to seek advice—not failure of sight. It may also be due to the use of too strong eserine drops, and may accompany, or perhaps mask, some injury to the eye. Papillitis may give rise to no symptoms at all, or perhaps to a *temporary* loss of vision, noticed on waking or on going from a well-lighted room to a darker one. In all cases of persistent headache the fundus should be examined.

The Eye as an Index of Age.—E. Clarke² says that premature presbyopia is

a definite sign of premature old age. In determining the amount of presbyopia, any error of refraction must, of course, be taken into account. Whilst discussing the other causes, toxæmia, worry, etc., he considers that eye-strain is a contributing factor, as it leads to a loss of nervous energy above and beyond the normal loss in the ordinary wear and tear of life. He sums up by saying that the premature ageing of a patient, indicated by the lowered power of accommodation, may be the first and even the only sign that something is wrong, and thus becomes a most valuable guide and priceless danger signal, because the patient, thus warned, can be thoroughly overhauled by a physician, and conditions found which may be put right if thus discovered in time. [It is certainly the experience of the reviewer that people who look young for their age usually require less presbyopic correction than those who do not. It is interesting that Indians and persons of mixed European and Indian blood, who usually age earlier than Europeans living in Europe, generally require a presbyopic correction earlier than Europeans. If, then, a patient appears to be more presbyopic than he should be, it would be wise for the practitioner to go into the question of his general health.—A. E. J. L.]

Tinted Glasses and their Value.—Sir Arnold Lawson³ says the subject of tinted glasses has become prominent lately, and much has been written, reasonably and unreasonably, about the destructive effect of ultra-violet rays on human eyes. Owing largely to alarms for which the optical trade was greatly responsible, the public seemed to have become largely imbued with a haunting fear of daylight, so that a large number of healthy people were wearing tinted glasses for protection. These seemed to have been prescribed in an indefinite and indiscriminate way. Under ordinary circumstances, protection by ultra-violet glasses was quite unnecessary. When extraordinary circumstances were apt to be encountered, the two main factors to be considered were the luminous and the heat radiations, rather than the ultra-violet. In high sunlight and glare, the darker shades of Fieuzal were much more effective than Crookes glass, and for extreme cases peacock-blue was most satisfactory. Artificial light was not stronger in ultra-violet rays than sunlight. Often, in physical disease and neurasthenia, the general function of the eyes was impaired, and help was needed for them. Smoked glass was still as valuable as ever, but it was somewhat depressing, and Fieuzal did not much interfere with the colour scheme and was as effective as smoked glass in other respects. *The wearing of tints was apt to become a habit*, and thus lead to inability to stand bright light unaided. For glass-blowers the best tints were Fieuzal 4 or 5, and peacock-blue. In all cases of cataract, tinted glasses should be worn in bright sunlight or glare. All patients in whom the lens had been removed should wear some protective tint out of doors, except on dark and cloudy days. In active inflammatory disease of retina and choroid, peacock-blue, which cut off the infra-red radiations, and most of the yellow and orange also, should be ordered.

Convulsion after the use of Cocaine in the Eye.—A case in which this occurred is reported by the Committee of the American Medical Association appointed to investigate the toxic effects of local anæsthetics.⁴

Lasting Paralysis of Accommodation after using Cycloplegics.—E. Jackson⁵ says that patients sometimes fear this may occur, and its possibility is held in mind by ophthalmologists. After a careful investigation it became clear to him that this fear is wholly without substantial foundation. The action of cycloplegics often lasts longer than is usually supposed. The author has seen various diseases develop after the use of a mydriatic, for which the blame was placed on the mydriatic, e.g., albuminuric retinitis, retinal hemorrhage, extending retinal detachment, etc. There are cases on record in which recovery of

accommodation has been delayed in the case of homatropine up to *fifteen days*, and in that of atropine for *several weeks*. Paresis of accommodation may be congenital. Some patients have a rare condition, *reduced power of accommodation*. It is apparently a congenital peculiarity. One boy of 15 showed the same power of accommodation before, as after, the use of homatropine. He had headaches which came on one hour after working at school. These were entirely relieved by the use of plus 1.5 D spheres for near work. [There is a common impression that the effects of atropine pass off in a week. This is incorrect. It usually takes two weeks in the experience of the reviewer, as in that of the author. Failure to remember this point sometimes causes great inconvenience to patients.—A. E. J. L.]

The Red Eye.—C. A. Hughes⁶ says five conditions commonly produce a 'red eye': (1) Inflammatory diseases of the lids—eczema, blepharitis, styes, etc.; (2) Conjunctivitis, bacterial or traumatic (as typified by a small foreign body beneath the upper lid); (3) Inflammations and ulcerations of the cornea; (4) Inflammation of the uveal tract; (5) Glaucoma. He stresses the point that if the discharge is thicker than water it usually indicates conjunctivitis. In iritis the discharge is watery. He advises always putting in a drop of fluorescein 1 per cent. This is harmless, and may lead to the detection of an abrasion or a corneal ulcer. Then the *tension* must *always* be taken. He calls attention to the importance of the early diagnosis of glaucoma. [The most signal service a practitioner can render a patient is the early diagnosis of glaucoma. (See MEDICAL ANNUAL, 1925, p. 193, in this connection.) Failure to make this diagnosis may be serious for him, as well as the patient. The reviewer would earnestly advise a practitioner to make a point of feeling the tension of *every* eye case. This will keep his 'touch' in practice. The 'feel' of an eyeball which is normal varies very considerably, just as does that of the abdomen or other normal structures. The possibility of a foreign body under the lid, or imbedded in the eyelid or in the cornea, needs ever to be borne in mind. The upper lid should be everted, and it and the cornea examined by means of a loupe and focal illumination. Experience shows that small foreign bodies are often not detected, and by careful men too.—A. E. J. L.]

The Clinical Significance of a Bloodshot Eye.—J. R. Anderson⁷ says that pain in the eye associated with pain in the brow always suggests iritis or glaucoma. Apart from these, the commonest cause of 'brow-ache' is eye-strain. The smallest errors of refraction cause the most evident symptoms of strain and interfere least with vision. Sometimes one hears of lids that are not stuck in the morning but are difficult to open. Eye-strain is the commonest cause of this condition. The author says it is wise to associate conjunctival injection and discharge with conjunctivitis, ciliary injection with iritis, and oedema and congestion with acute glaucoma. [It cannot too often be insisted on that a person may have even $\frac{1}{2}$, or over normal vision that is to say, judged by the ordinary standard, and yet have a small amount of astigmatism, the correction of which, in an overworked, highly-strung individual who uses the eyes a great deal, may afford the greatest possible relief. Such cases are frequently seen in girls working in offices.—A. E. J. L.]

Cysticercus of the Vitreous.—G. H. Kress⁸ gives a most graphic and interesting description of the development of a cysticercus of the vitreous which occurred in a woman of 26. In the author's own words it is summarized somewhat as follows: There was, at the onset, what seemed to be a detachment of the retina, which, under dilatation at a later date, proved to be a bluish-white cyst, this cyst being almost of a perfect spherical shape, and moving slowly in the vitreous with movements of the patient's head. This bluish-white cyst had, practically at all times, an orange or orange-red halo at its periphery,

shading off somewhat as do the colours of the spectrum. Later the greyish-white head and neck of the parasite put in an appearance, at about the five o'clock meridian, and this neck could change its shape and become thicker through contraction, and it could bend itself and twist on itself, and at times invaginate or probably contract within the cyst until practically nothing but a slit was to be seen at its former site. There were also present little masses of what appeared very small spheres of coagulated vitreous that had been sucked in by the suctorial orifices and then spat out, these little masses at times showing one that would have been a thread like a stringer, of a disc diameter or so in length, and that ran from the mass in the head of the parasite. The whole of the upper half of the vitreous became what seemed to be an interwoven mass of greyish proliferating exudate. The activity of the head and neck movements and of the suctorial and snout or rostellum areas, as well as the undulating movement of the vesicle proper, could be seen ophthalmoscopically. The eye had to be excised. (*See Plate XIV*).

Chica⁹ reports a case, exactly similar in almost every respect to the one described above, in a patient 8 years old. This is the third he has seen in Bucharest.

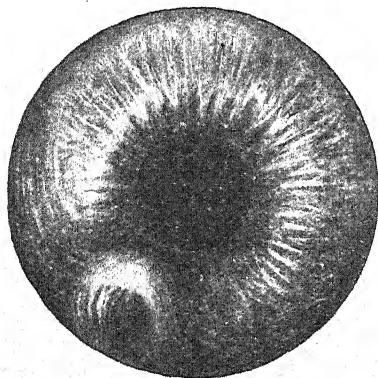


Fig. 10.—Cyst of ciliary body and iris.
(Re-drawn from the 'Klinische Monatsblatt für Augenheilkunde'.)

Cyst of the Ciliary Body and Iris.—H. H. Elschni¹⁰ describes a case of cyst of the ciliary body which involved the root of the iris and projected forward into the anterior chamber (*Fig. 10*). The practical point of interest is that the experience of the author confirms that of most writers, viz., that complete excision was finally necessary to effect a cure. In this case the anterior wall was first divided. At a second operation, a portion of the anterior wall of the cyst was excised. The cyst recurred after each of these proceedings, but was finally effectively dealt with by a complete excision of the cyst and of the parts of the ciliary body

immediately surrounding it. [These cases are not common, and, in the absence of very special experience, complete removal is the safest plan for most surgeons.—A. E. J. L.]

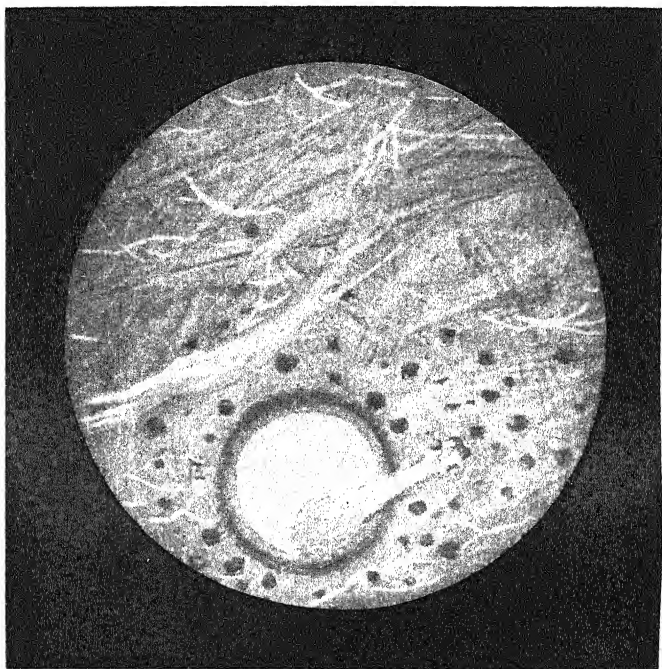
Simple Operation for Relief of Mild Types of Entropion and Ectropion of the Lower Eyelid.—J. E. Jennings¹¹ has devised the operations described below in his own words for mild cases of ectropion and entropion. The instruments required are a Beer's knife, scissors, No. 1 catgut sutures, and a needle-holder. The author uses, as a local anæsthetic, a subcutaneous injection of a few drops of a 1 per cent solution of procaine. Procaine acts slowly, and after the injection fifteen to twenty minutes should elapse before the operation commences.

Operation for entropion: One should first estimate how much the lid must be drawn down to eliminate the entropion, and make the length of the incision just twice that amount. If the lid turns in $\frac{1}{4}$ in., then the incision should be $\frac{1}{2}$ in. long. The incision is vertical, commencing just below the lid margin and extending downward $\frac{1}{4}$ in., dividing skin and superficial fascia. Without undermining the skin, a vertical suture is introduced through the skin above the upper extremity of the incision, carried down along the bottom of the

PLATE XIV.

CYSTICERCUS OF THE VITREOUS

(G. H. KRESS)



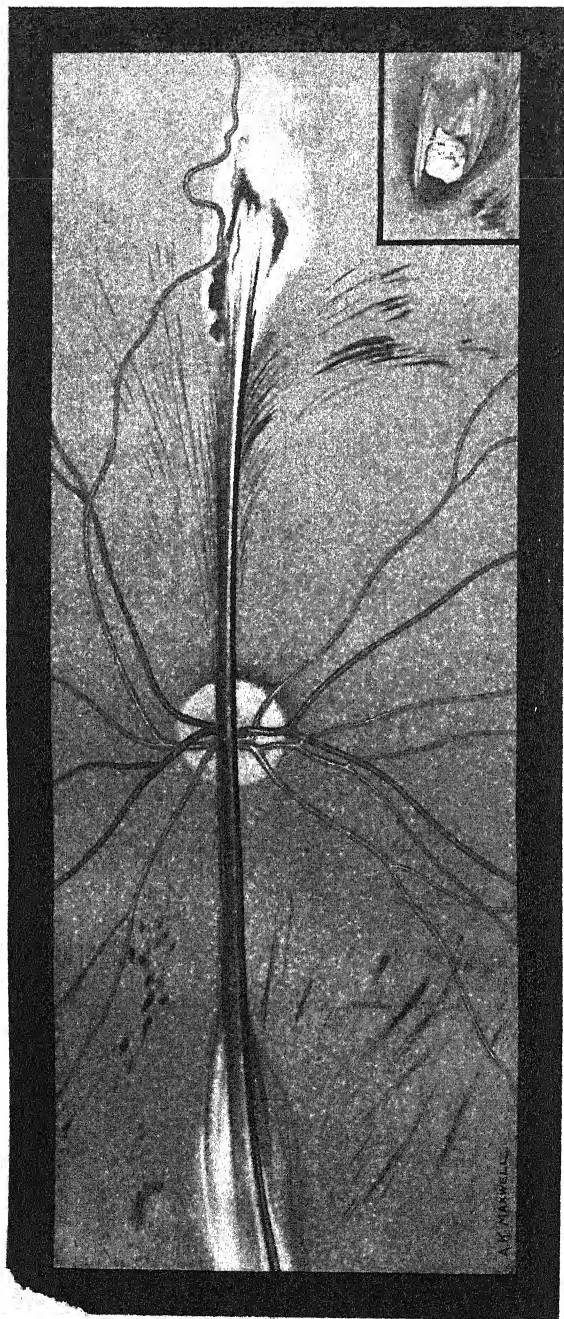
Appearance of the fundus with vesicle and protruding head.

Kindly lent by the 'American Journal of Ophthalmology'

PLATE XV.

INJURIES OF THE RETINA

(SIR WILLIAM LESTER)



Two scars on the retina, one on each side of the disc, bridged across by a fan of hemorrhagic fibrous tissue, which came forward to the region of the scleral scar. Inset shows the foreign body lying far forward embedded in blood-stained vitreous.

OPICAL ANNUAL, 1926

Kindly lent by the 'British Journal of Ophthalmology'

wound, and brought out through the skin just below the lower extremity of the incision. When this suture is tied, the margin of the lid is drawn down, and what before was a vertical wound now becomes a horizontal one, which is closed by two more vertical sutures, one placed on each side of the central one (*Fig. 11*). If the length of the incision has been estimated correctly, the lid margin will have regained its normal position and perhaps show a trace of ectropion, which will disappear in a few days.

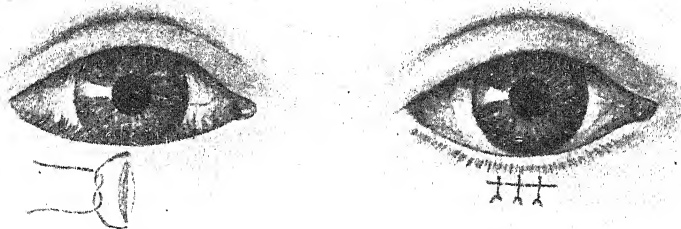


Fig. 11.—Entropion operation: showing the incision and central suture, and the operation completed.

Operation for ectropion: The operation is similar to that for entropion, except that the incision is horizontal and should be made a little longer to get a decided amount of over-correction. The horizontal incision should be placed near the lid margin under the most pendent part of the lid. When the central suture is tied, the ends of the incision are drawn together, forcing up the margin of the lid and changing the horizontal wound into a vertical one, which

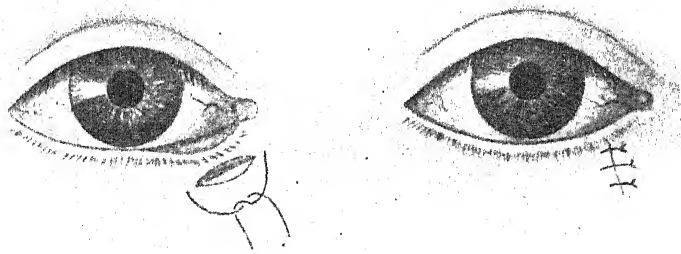


Fig. 12.—Ectropion operation: showing the incision and central suture, and the operation completed. (*Figs. 11 and 12 re-drawn from the 'Journal of the American Medical Association'.*)

is closed by two more sutures, one placed on each side of the central one (*Fig. 12*). As there may be considerable tension on the sutures which might cause them to tear out, they should be supported by strips of adhesive plaster until healing takes place. Among other advantages the author claims it is simple and easy of execution, and that the skin of the lid is not stretched. [As pointed out by W. H. Wilder and others in a discussion on ectropion, its simplicity is a point in its favour. It may therefore be recommended.]

practitioners. Wilder truly points out that in these cases the element of spasticity comes in, and that it is often necessary to remove some of the orbicularis muscle fibres. This operation therefore would not ordinarily be selected for such cases. If, however, there is a mild degree of spasticity, and this operation is favoured, it should be a simple matter to separate the margins of the wound and dissect out and divide the muscle fibres, especially those near the edge of the lid.—A. E. J. L.]

Treatment of Partial Trichiasis.—A. Terson¹² advises, for the removal of hairs that are situated well apart from each other, the use of a Thermo-cautery of a special type. It has a steel ball at the end from which projects a *very sharp needle-point*. Fig. 13 illustrates one of the most useful types of cautery. It must be heated in a gas flame, as a spirit lamp is not satisfactory. The author says that in spite of this method being very old and simple, it is excellent for such cases. Electrolysis is advised for cases with many hairs or when the hairs are close together. [The simplicity of this method will

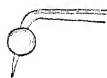


Fig. 13.—Terson's thermo-cautery for treatment of partial trichiasis. (Re-drawn from the 'Annales d'Oculistique', Brussels.)

appeal to others besides the author. The reviewer has tried it with a similar type of instrument, and found it simple and effective for an odd hair or two, well separated.—A. E. J. L.]

Re-formation of the Lachrymal Passages by means of Skin-grafts.—V. Morax and V. Valière-Vialeix¹³ have devised an operation for restoration of the lachrymal passages in cases in which intense lachrymation indicated removal of the lachrymal gland for its relief. Three cases were operated on in which the canaliculi were patent. In one of these the lachrymal sac had been removed. Success was obtained in two cases, but the third was only partially successful, owing to ozena, which led to closure of the nasal orifice. Such cases are not suitable for operation. In a fourth case an attempt was made to restore the lower canaliculus, with only partial success. The technique is fully described, and should be read by those who wish to try this operation. The chief points are the use of a large skin-graft rolled round a piece of shaped paraffin wax about as big as half the little finger, so as to allow for subsequent shrinking. An opening is made in the wall of the nose, and the graft fixed between it and an opening into the conjunctival sac in front of the caruncle. The author says the operation is not advocated for general use, but with some improvements which he suggests as the result of his experience, he thinks it will be of service in a certain number of cases in which, up till now, ablation of the lachrymal glands was the only palliative remedy available. [No one should attempt this operation without, if possible, reading the original paper, which gives important details.—A. E. J. L.]

Rôle of the Epithelial Cell in Conjunctival and Corneal Infections.—H. J. Howard¹⁴ has confirmed the findings of Lindner. He says that leucocytic phagocytosis seems to play no part in the fight that takes place within the tissues, between the epithelial cells and the invading bacteria. The leucocytes are effective, as phagocytes, only against bacteria which have been loosened from their hosts and then thrown into the secretion. This most interesting paper should be read in full. One of the chief facts of clinical importance which the author claims to have established is that, to examine properly a corneal or conjunctival infection, actual scrapings must be taken from the surface of these structures, adequate care being, of course, used in the case of the cornea, to avert any damage from this. It would be suitable for certain cases only. He says: "The principle has been established that the presence of bacteria in smears from the conjunctival secretion, and the results of

cultures made from such smears, do not in themselves prove the etiology of an inflammation of the conjunctiva or cornea". He says that the inclusion bodies of trachoma and inclusion blennorrhœa have been shown by Botteri and Lindner to be biologically identical. It is his opinion that there are two types of trachoma: (a) ocular or insidiously beginning trachoma, (b) genital trachoma, which, in the matter of origin, includes blennorrhœa of the new-born and acute trachoma of adults.

How to Help certain People with Defective Vision to Read.—There are certain people whose defect of sight is due to opacities of the dioptric media, and whose chief trouble is their inability to read even by the aid of a loupe. E. Landolt¹⁵ finds that such individuals can be greatly helped by increased illumination, so arranged that light is concentrated on the paper or book. He has had an apparatus constructed by Meyrowitz, in Paris, which consists of a high-power electric lamp enclosed in an opaque metal tube, in the lower wall of which is an aperture placed opposite the lamp. The tube is fixed horizontally to an upright stem, and can be rotated and moved vertically at will. The light from the lamp is concentrated on the book beneath the tube, while surrounding objects are in darkness. If desired, this light can be tinted by coloured glasses inserted in the aperture. [The reviewer can well believe that such an apparatus may prove of use in some cases. Certain patients with incipient cataract are much helped if they are told to sit in the evening with their backs to a single reading lamp, furnished with a reflector, so that the light falls on the book from behind, the rest of the room being in darkness. Some patients, as a matter of fact, discover this for themselves, and improvise an arrangement of some sort which by experience they find helpful.—A. E. J. L.]

Vision and Target Shooting.—C. W. Wirgman¹⁶ has examined the eyes of many of the Bisley competitors. He says the public believe that perfect vision is necessary for a good shot. This is not quite accurate. Ability to see the object is certainly necessary, but not perfect vision. Fatigue of the eye, and not bad definition, is the main cause of the difficulty in scoring well for a number of consecutive shots, as required in present-day competitions. Younger men, though not emmetropic (normal sighted), do not feel the need of glasses so much, as youth does not feel fatigue so much. For shooting, a special frame is required so as to enable the shooter to look through the optical centre, in the actual position he takes up, when firing. Almost all men use the left eye to look through the telescope; a normal centring only is required for it. Men should be warned only to use these glasses when actually shooting. [The reviewer found once that the ordering of a cylinder of plus 0.25 gave great satisfaction to the champion shot of the Indian Army. Others prefer to be without small corrections.—A. E. J. L.]

Evislon of the Optic Nerve in a Ski-ing Accident.—O. Dymling¹⁷ records a case in which a ten-year-old boy fell whilst ski-ing. As a result of the fall, one of his sticks struck the nasal side of the orbital region, forced the eyeball forwards, and led to evulsion of the optic nerve, with, of course, total blindness as a result. There was very little intra-ocular hæmorrhage.

The Effect of Foreign Bodies Striking the Retina.—Sir W. T. Lister¹⁸ says that when a foreign body derived from a projectile strikes the retina, a variety of things may happen. It may remain embedded in the retina, in which it often causes puckering of the membranes, or it may penetrate its coats and pass into the orbit. He describes one case, however, of which the only explanation he can offer is that a fragment rebounded twice on the retina (Fig. 14). There was a slightly pigmented scar in the sclera at the entrance of the foreign body on the inner side of the cornea. The ophthalmoscopic picture (Plate XV) showed two scars on the retina—one on the inner, the other on the outer

side of the disc. These were connected by a fan of fibrous tissue, which could be traced forwards towards the wound of entrance. The foreign body was seen glistening like a jewel in the vitreous, situated far forward and on the outer side. An X-ray photograph demonstrated the foreign body at a spot which corresponded with the ophthalmoscopic estimation, and there was no indication of any other foreign body in the orbit. The field of vision showed two scotomata in the horizontal meridian corresponding with the two scars on the fundus.

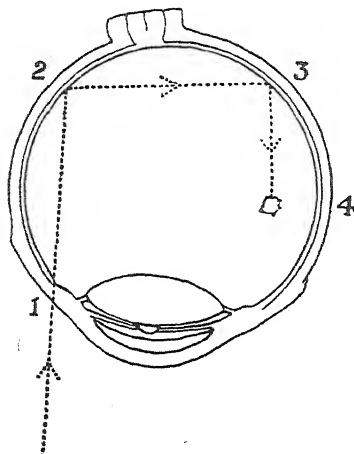


Fig. 14.—Supposed track of foreign body striking the retina. (Kindly lent by the 'British Journal of Ophthalmology'.)

Retinal Hæmorrhage in the New-born.

—M. W. Jacobs¹⁹ says that Sicherer found binocular retinal hæmorrhage 19 times in 191 babies. All investigators agree that these hæmorrhages are fresh, and could not possibly have developed during intra-uterine life. The hæmorrhages from the smaller vessels would seem to be the result of a congestion, and are etiologically related to the minute and larger cerebral hæmorrhages. In 157 cases, examined within twenty-four hours after birth, hæmorrhages were found 19 times. In 33 cases examined after the first day of life, hæmorrhages were found 4 times. In 11 of the series of 19 cases, the hæmorrhages were chiefly in the region of the disc; in the others, elsewhere in the retina. In only one does the author note that, in addition to hæmorrhage in the region of the disc,

there were a few at the macula. In a discussion following this paper, A. J. Bedell²⁰ reported finding 9 cases of retinal hæmorrhage in 122 cases, and F. P. Cahoun said he had also had a similar experience.

Iritis of Menstrual Origin Treated by Glandular Therapy.—Valière and Schiff Wertheimer²¹ report the case of a girl, 15 years old, in whom definite symptoms of iritis, with marked hypotony, appeared at the time of menstruation, or at the time when the menses should have appeared. Wassermann reaction and cutaneous reaction to tuberculin were negative. As signs of thyro-ovarian insufficiency were present, Thyroid and Ovarian Extracts were prescribed. The attacks of iritis ceased at once.

Treatment of Lime Burn of the Eye.—O. Barkan and H. Barkan²² publish four cases in which lime-burn of the eye had occurred, leading to opacity of the cornea. Two of them would presumably have remained blind for the rest of their lives, say the authors; yet their vision was improved to $\frac{1}{16}$ and Jaeger 1, and $\frac{1}{10}$ and Jaeger 2 respectively. These are striking results. The method was devised by Zur Nedden and Guillerz. For old opacities a solution of Ammonium Tartrate is used, which must be neutral. The commercial product is usually slightly acid; this causes pain, and may spoil the result as well. Zur Nedden advises immersing the thoroughly cocaineized eye in a 4 per cent solution, for a quarter to half an hour twice daily, and within a few days increasing it to 10 or 20 per cent according to the sensitiveness of the patient. In some cases, as in one of the authors', if the solution has no effect, the cornea is scraped and a certain amount of the incrustation removed. The treatment is then applied, and is effective.

Fresh cases have also been treated, and in all of them there was a marked alleviation of symptoms. In the opinion of some who had sustained burns on previous occasions, the period of inflammation and discomfort was reduced by a half. In one case of marked burning sensation of the somewhat red and swollen skin of the eyelids, the burning sensation was instantly and permanently relieved by a moment's irrigation of the skin with the solution. The authors give a special warning against the use of this very active solution by inexperienced hands. It is *not suitable for an emergency measure*, but fortunately the lapse of time between the injury and the application plays no great rôle, if any, in its clearing action. It appears harmful to apply the remedy before every particle of lime has been mechanically removed.

Sympathetic Ophthalmitis occurring after Preventive Removal of the Injured Eye Five Days after the Injury.—H. Villard²³ reports a case in which a woman fell against a stiff branch of a vine and damaged her eye. There was a rupture of the sclera, and hernia of the iris and ciliary body. Immediate enucleation was declined, but agreed to *five days later*. Twenty days after the operation typical sympathetic ophthalmitis developed in the other eye. The vision was reduced to $\frac{1}{3}$ three days after its onset. It yielded to energetic treatment with Atropine, Neo-salvarsan, and Cyanide of Mercury intravenously, massive doses of Sodium Salicylate, and the production of a Fixation Abscess by means of a subcutaneous injection of turpentine. She recovered, and was well after a year, with $\frac{7}{10}$ vision. The Wassermann reaction was negative on admission. The author stresses three points: (1) That though this case is a rare one, it completely invalidates the teaching of many distinguished authors, founded largely on the experience of the Great War, that removal of the damaged eye within fifteen days is a sure preventive of sympathetic ophthalmitis. (2) That to ensure prevention of sympathetic ophthalmitis, removal of the injured eye must be practised *at an earlier date even than five days* after the accident. (3) The experience of this case points to prognosis being more favourable in cases in which early removal is practised, if energetic treatment is carried out. [This case is a very important one, which should be remembered. The experience of the reviewer, however, is that in Northern India, where most of his patients absolutely refused to have eyes excised which would be a source of danger in Europe, sympathetic ophthalmitis was extremely rare. He does not attempt to explain this, but it is nevertheless his experience, and may be a source of comfort to others.—A. E. J. L.] (*See also EYE, SLIT-LAMP MICROSCOPY OF.*)

Miners' Nystagmus, its Diagnosis and Origin.—Miners' nystagmus is a question of great national importance. This article, and the discussion in which many leading authorities took part,²⁴ should be read by all interested. Free-land Fergus, after dealing with the question of diagnosis, advanced the theory that the disease might be due to a specific infection. This would explain why the disease was frequent in some districts and not in others. It did not seem to be due to posture or defective illumination. It was accompanied by a good deal of constitutional and even of mental disturbance. All seemed to point to a widely diffused pathological process. He did not think defective refraction had anything to do with it, as all his cases were examined most carefully in this respect. All had considerable diminution of visual acuity, however. He was not sure patients completely recovered. They came back years afterwards complaining of frontal and occipital headaches. Part of this might be due to psychological causes. F. Robson, who has made a very careful statistical study of the matter, appears to think that miners' nystagmus is due to certain volatile products given off from coal. Temperature and pressure affects the giving off of these. Coal which gives off most 'volatile' is found in Monmouth-

shire, and in this county the percentage of miners' nystagmus is greatest. B. Cridland considered Robson's views merited the greatest consideration. It must be recognized that whereas miners' nystagmus was so infrequent in candle mines as to be non-existent for all practical purposes, it existed in lamp mines, and that between the different conditions pertaining in these two types of mine lay the clue to the etiology of the disease. If it was not safe to use an open light in a mine, it could not be considered an ideal place for a man to work in. T. Harrison Butler dissented from the view that lack of visual acuity could be regarded as a diagnostic sign of the disease. If errors of refraction were corrected and the test types put much lower than the height of the eyes, a large number would be found to see well. G. H. Pooley distinguishes two kinds of neuroses: one, most intense about three months after leaving work; another, he thought, was due to the fact that the man knew he was being kept under observation for compensation. The longer he was kept away from work, the worse he became. He had seen such cases lasting ten years in which the patients were miserable wrecks. These did not occur before the compensation era. They were due to the payment of money compensation for this condition.

Mistakes in Diagnosis.—A surgeon²⁵ was consulted by an elderly man, who had only one useful eye. He complained of failing vision in it. Nothing could be seen amiss except a few opacities in the vitreous. He was ordered mercury and potassium iodide, and told to call again in a week. He returned with acute mercurial poisoning. His mouth was so sore he could not smoke for a month. This, however, cured him, as he was suffering from tobacco amblyopia. [The reviewer knows of a case of a man with immature cataract who was told by an ophthalmologist that an operation would be done later when the state of his vision required. The patient came back later with his vision so much reduced that he raised the question of operation. A careful examination of the fundus failed to show sufficient alteration in the lens to account for the loss of vision. It was found out that tobacco amblyopia had developed, from which he ultimately recovered. Operation in such a case would have been a tragedy.—A. E. J. L.]

Two Years' Experience with Mercurochrome in Ophthalmic Therapeutics.—M. F. Weymann²⁶ says that in corneal ulcer, if infected, the mercurochrome aids greatly in getting the ulcer clean, and seems to stimulate the growth of epithelium, as does scarlet red on skin ulcers. In chronic dacryocystitis where there is a mucopurulent discharge from the sac, it may be changed to a simple mucous discharge in a couple of days by the instillation of the mercurochrome solution. In summing up, one may say that in the 2 per cent solution of mercurochrome we have an unusually non-irritating and penetrating powerful antiseptic for use in ophthalmic therapeutics. Mercurochrome is not to be thought of as a substitute for any of the well-known therapeutic agents which we now possess, but rather as a valuable addition to our present remedies.

Autohemotherapy in Ophthalmology.—In the MEDICAL ANNUAL for 1925, p. 153, will be found a report of Guiral's work on auto-serum therapy in sympathetic ophthalmitis. This was based on A. C. Woods' work in Baltimore. The results reported by Guiral are remarkable. The reviewer was told by Dr. Woods that he had been unable to confirm Guiral's experimental work. The question therefore is in need of further investigation. D. D. Dominguez has used injections of freshly-drawn blood. It is taken in quantities of from 2 to 3 c.c. from a vein in the neck, and injected straight into the muscles of the patient; rarely subcutaneously. It would appear useful in affections of the cornea and serpiginous ulcer, but does not seem to be as good as injections of milk. [It will probably interest practitioners that the author has

experienced no trouble in these 'direct' injections. A. C. Woods read a paper at the Convention in July last, on the use of uveal pigment in the diagnosis and treatment of sympathetic ophthalmia. It was very favourably commented on. Briefly, such patients show a hypersensitivity to uveal pigment, when tested by a complement-fixation test of the blood serum. The treatment is based upon the idea of removing the specific pigment hypersensitivity by the repeated injections of small amounts of uveal pigment, and so incidentally stimulating antibody reaction. *Seventy-one cases* of traumatic cyclitis have been examined. The author believes this treatment is of definite value in sympathetic ophthalmitis, although it is not an absolute specific. It may be combined with other forms of treatment. In conversation with Dr. Woods, the reviewer gathered that it needs special experience, and at present is only fit for use by an expert. Sympathetic ophthalmitis is a very terrible disease, as it often leads to total blindness. The method needs further trial, but from hearing the paper and talking to the author and a well-known authority who has had experience of this method, the reviewer has formed the opinion that it constitutes an advance in the treatment of this most serious affection. —A. E. J. L.]

Radium in Ophthalmology.—L. A. Lane²⁷ has studied the literature for the last twenty years, and concludes that radium is of use in many benign conditions. It is a *specific in vernal conjunctivitis, trachoma*, and certain lid lesions. It needs care in its application, as in too large or long-continued doses retinitis and optic atrophy have followed, as well as burns in the treatment of vernal conjunctivitis and pterygium.

REFERENCES.—¹*Lancet*, 1925, i, 1065; ²*Practitioner*, 1925, April, 267; ³*Lancet*, 1924, ii, 801; ⁴*Amer. Jour. Ophthalmol.* 1924, June, 477; ⁵*Ibid.* 1925, March, 207; ⁶*Clinical Jour.* 1925, April, 187; ⁷*Med. Jour. of Australia*, 1925, April, 396; ⁸*Amer. Jour. Ophthalmol.* 1924, 185; ⁹*Soc. Roumain. d'Ophth. de Bucarest* (abstr. *Ann. d'Oculist.* 1925, Jan., 56); ¹⁰*Klin. Monats. f. Augenh.* 1925, March, 476; ¹¹*Jour. Amer. Med. Assoc.* 1924, Oct. 25, 1329; ¹²*Ann. d'Oculist.* 1925, 263; ¹³*Ann. d'Oculist.* 1925, March, 161; ¹⁴*Amer. Jour. Ophthalmol.* 1924, Dec., 208; ¹⁵*Arch. d'Ophthal.* 1923, July (abstr. *Brit. Jour. Ophthalmol.* 1925, June 30, 3); ¹⁶*Lancet*, 1924, ii, 79; ¹⁷*Acta Ophthalm.* 1924, fasc. iii, 257; ¹⁸*Brit. Jour. Ophthalmol.* 1924, July, 316; ¹⁹*Jour. Amer. Med. Assoc.* 1925, ii, 1641; ²⁰*Ibid.*; ²¹*Ann. d'Oculist.* 1925, March, 205; ²²*Jour. Amer. Med. Assoc.* 1924, Nov. 15, 1567; ²³*Ann. d'Oculist.* 1925, May, 361; ²⁴*Proc. Roy. Soc. Med.* (Ophthal. Sect.), 1925, 17; ²⁵*Brit. Jour. Ophthalmol.* 1924, Nov., 544; ²⁶*California and Western Med.* 1924, Oct., 493; ²⁷*Jour. Amer. Med. Assoc.* 1924, Dec. 6, 1838.

EYE, SLIT-LAMP MICROSCOPY OF. *Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)*

Slit-lamp microscopy is making steady headway all over the world, and there is abundant evidence in the literature as to its practical value in clinical work. (For a description of slit-lamp microscopy, with illustrations, see MEDICAL ANNUAL, 1925, p. 161.) The essential feature of the slit-lamp is focal illumination. Its cost is prohibitive to most practitioners, but T. Harrison Butler¹ points out that some of its advantages can be obtained by using a 'half-watt' gas-filled bulb, or better a small motor-car bulb with a thick short filament. The latter, of course, needs a resistance if used with the town electric supply. The lamp is used at a distance of 3 feet. The beam is focused with a hand lens on the cornea or lens, as the case may be, and a corneal loupe may also be used, taking the place roughly of the microscope. By this method, for instance, the situation of an opacity in the lens can be determined, and fine deposits on the back of the cornea, K.P., which are not visible by direct light, may be seen by light reflected from the iris, so-called 'retro-illumination'. This may be of great help in establishing the diagnosis of an early *iridocyclitis*. The circulation of blood in the corneal vessels may also be seen. An interesting field of study is thus opened up at a trifling expense. The original paper should be consulted.

The Early Diagnosis of Sympathetic Ophthalmitis by means of the Slit-Lamp.—F. Motolese² reports the case of a man, 61 years of age, whose eye was injured and shrunken. Five months after, the only perceptible symptoms in the other eye were a lowering of vision to $\frac{1}{4}$, and white glistening deposits on the framework of the vitreous. The shrunken eye was removed, and treatment by salvarsan carried out. Four months later these deposits had disappeared. Vision was $\frac{1}{2}$. The author calls attention to the importance of the slit-lamp findings in suspicious cases of sympathetic ophthalmitis. [Every case in which there is the least suspicion of sympathetic ophthalmitis should be carefully examined by the slit-lamp.—A. E. J. L.]

REFERENCES.—¹*Brit. Med. Jour.* 1924, i, 945; ²*Bollet. d'Oculist.* 1924, 1029.

FACE AND LIPS, INFECTIONS OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

It is not sufficiently realized that a septic focus in the neighbourhood of the lips or chin, if surgically interfered with, may be rapidly followed by death. During the war the writer had under his care an officer awaiting an operation for bone-grafting an ununited fracture of the arm. Whilst shaving, he cut a small septic pimple on the upper lip by the side of the nostril. He died from acute sepsis within two days. When visiting Professor Noordenbos, of Amsterdam, in July, 1925, the writer was shown a patient on whom a minor operation for a small septic focus in the upper lip had been performed. The patient's temperature was 105°; the left eyeball protruded; she was acutely septic and obviously moribund. On his return to Dublin, the writer was told by a colleague, Dr. Lane, in the Children's Hospital, that a patient had come to him a few days previously on whom a minor operation had been performed to relieve a small septic condition of the chin, and that death had followed rapidly from acute sepsis.

In the MEDICAL ANNUAL, 1925, p. 163, staphylococcal infection of the face and lips is discussed. Thrombophlebitis follows furuncles of the lip far more frequently than elsewhere, and the danger of the condition lies in the tendency for infection spreading in the lips and nose to involve the labial venous plexus. There is a rich venous plexus in the lips. The collecting venous trunk in the upper lip empties into the facial at the level of the nostril or lower border of the orbit. The first principle of treatment for phlebitis is rest. This cannot be obtained in the lips, and thus infected thrombi are pumped onwards. (See Martin, *Ann. of Surg.*, July, 1922.)

The writer (W. I. de C. W.) is opposed to anything in the nature of operative interference in early cases of infection about the lips and chin. There should be no pressing, squeezing, or exploration with blunt instruments. In a number of reported cases death was due to infective thrombosis of the cavernous sinus. A preliminary symptom is exophthalmos, which accompanies swelling of the eyeballs and face; ptosis or squint occasionally occurs by a spreading infection involving the nerves in relation to the wall of the sinus. Infection of the sphenoidal sinus is also common.

The anastomosis of the superior ophthalmic veins with the facial at the root of the nose accounts for the ready infection of the cavernous sinus in septic areas drained by the facial vein. Martin asks: "Why have we five deaths only amongst eighty carbuncles of the back of the neck—many of these in the old and feeble and diabetic—and seven deaths in ten patients with carbuncles of the lip—all but one below forty-five years old?" It seems clear that the mortality is not due to infection of the lips by bacteria of unusual virulence, but the infection when it comes, for anatomical reasons, can rapidly cause death by involvement of the cavernous sinus, or by a portion of infected clot being carried by the blood-stream to the heart and lungs.

The danger of septic infection about the lips—a danger which is absent from similar infections elsewhere—is due to the fact that the skin of the lip is closely attached to the underlying muscles, and thus a staphylococcal infection can only spread under tension in close relationship with the rich plexus of veins. Infective phlebitis frequently follows if the infected area is subjected to trauma, such as squeezing a pimple or by pricking it with a needle or pin.

The treatment of mild infections in this dangerous area is of a negative kind. The patient should be cautioned not to handle the infected focus. Early puncture (says Martin), before there is a definite focus of suppuration, and packing the small hole to resist bleeding, is eminently suited to create conditions in the dense tissue of the lip favourable for rapid bacterial growth and the spread of infection to the labial veins. Local anaesthetics should never be used. A stock vaccine of *Staphylococcus aureus* may be tried, and the parts carefully washed if possible with a 40 per cent solution of magnesium sulphate—Morison's Magnesium Sulphate Paste (*Brit. Med. Jour.*, 1924, i, 703) may be used with advantage.

FACE AND MOUTH, PLASTIC SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Cleft Palate.—The writer, having had several failures following cleft palate operations in a children's hospital, endeavoured to ascertain the cause. He had continuously laid stress on the necessity of freely mobilizing the edges of the cleft in such a manner that there was no tension whatever on the sutures. As a rule, if this fundamental principle is observed, cleft palates will heal in a satisfactory manner. The mobilizing of the lateral flaps may, however, be over-done, and ischæmia of the edges of the cleft will follow—he attributes some failures to this cause.

H. H. Rayner¹ opens an interesting paper by stating that the results of operation, immediate and remote, are uncertain and sometimes very disappointing. He gives a record of results in 125 cases. He points out that infants with complete cleft palate sometimes perish between the performance of the hare-lip operation at three months old and the time for the palate operation at, say, two or three years of age. He thinks that the most suitable age for operation is between two and four. He classifies his causes of failure as follows: (1) Performance of the operation in unsuitable subjects—i.e., children of poor physique, anæmic children, and children showing a fairly severe grade of catarrh of the nasopharynx with mucopurulent secretion. (2) Infection from pre-existing infection of nasopharynx, as in No. 1. Latent infection—scarlet fever and measles—at time of operation. A severe infection is likely to cause a breakdown of the entire suture line. (3) Ischæmia of the edges of the cleft, from too extensive lateral incisions or from the tying of sutures too tightly, is often responsible for a hole at the back of the hard palate. Such a hole, even if fairly large, may close spontaneously in the course of months, but the resulting palate is shortened from dragging forwards of the soft palate by cicatrization. (4) Inversion of epithelial edges is another cause of holes, particularly in the hard palate. (5) Tension. This is usually regarded as the source of all evil, but I have not found it by itself to be a common cause of failure. In many cases there is little or no tension on the flaps at the conclusion of the operation. Tension begins to exert an influence a few days after operation as the lateral incisions begin to contract, and may then produce a gap in the suture line, particularly at the front part of the soft palate, unless the edges of the cleft have been accurately sutured with a durable material (silk-worm gut).

The operative procedure recommended by O. L. Addison² is as follows:—

"The child is arranged with a sand-bag under the shoulders, throwing the head well back. The surgeon sits at the head of the table, with his assistant on the child's right and the anæsthetist on the left. As the working space is confined, the simplest *efficient* gag is the best, and this, I think, is Mr. Waugh's small-toothed one. The tongue is held forward by a stitch or small-toothed forceps. Sponging is best done by the surgeon only, the assistant confining his attention to keeping the chin up and the tongue forward with his right hand, while with his left he steadies the patient's head. For the sewing up a good light is absolutely essential, and failing a powerful overhead lamp the best illumination is obtained from a head-lamp worn by the assistant, a much more convenient arrangement than for the surgeon to wear it himself. The mouth being well opened, the operation is begun by making the lateral incision on the side away from the gag.

"The incision begins on the lower jaw and is carried up the ascending ramus on to the upper jaw behind the last tooth; then turning inwards it is continued immediately internal to the teeth as far forwards as may be necessary. An elevator is then worked into the incision a little in front of the last premolar,

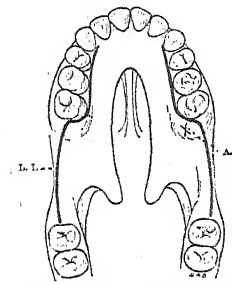


Fig. 15.—Cleft-palate operation (L. O. Addison). L. I., Lateral incision; A., Alveolar border. (Re-drawn from the 'Lancet'.)

and the mucoperiosteum is raised towards the middle line until finally the elevator appears in the cleft. The mucoperiosteal flap is then separated from the bone as far back as the junction of the hard and soft palates, and also forward well beyond the end of the cleft, if that is incomplete, and nearly as far as the alveolar border in the case of the complete cleft. During this part of the operation there is free bleeding, which can be controlled by gauze packing. The posterior part of the incision is then dealt with, an elevator being used to widen it and push the whole soft palate and fauces towards the middle line. Special attention is given to freeing the tissues at the posterior end of the alveolar border (Fig. 15, A). The incision is now plugged with gauze soaked in adrenalin, and, after moving the gag across, the procedure is repeated on the other side.

"The next step is the separation of the soft from the back of the hard palate. This is best done with a small pair of sharply curved scissors working from the cleft outwards. It is never an easy part of the operation, and in a small baby with a cleft of the soft palate only may be extremely difficult. Nevertheless it must be thoroughly done, and the separation carried out as far as the hamular process. It is convenient to work on the side opposite the gag. The two halves of the palate should now be absolutely flaccid, and meet without tension from end to end. The trimming of the edges of the cleft should be left till now to avoid bruising and contamination of the raw surfaces. It is generally unnecessary to cut anything off the edges of the hard palate, but a broad strip of mucous membrane must be removed from the soft. This is best done with a very sharp knife, the palate being made tense by a fine suture passed through each half of the uvula, and held by the assistant; this suture is also a great help in keeping the palate taut during the sewing up.

"Suturing is best done with Lane's cleft-palate needles and needle-holder, and the suture material should be the finest ophthalmic silkworm gut. On no account should silk or catgut be used. The suturing starts at the front, the greatest care being taken to see that the edges of the hard palate are well everted and that the stitches are not tied too tightly. The stitches should be

about $\frac{1}{2}$ in. apart, and should be continued round the uvula for some distance on to the back of the soft palate. At one time I used in addition a continuous suture along the dorsum of the cleft throughout its length as an aid in securing eversion of the edges of the hard palate, but I have given this up as unnecessary. The mouth is now carefully cleaned of dried blood, etc., by small gauze mops wrung out in saline, the suture line is painted with Whitehead's varnish, and the gauze removed from the lateral incisions, though if there is any oozing from them, small gauze plugs without adrenalin may be left in, but must be removed within twelve hours.

"In a complete single cleft no attempt is made to join the alveolar margin, and in double cleft there is a space left behind the premaxilla. In neither case is it a matter of importance from the point of view of speech or swallowing; for the space rapidly closes in, and in any case patients with complete clefts generally have to wear a small plate on account of the irregularity of the incisor teeth.

"This method of operating most usually results in complete union with a good movable soft palate. A failure from an acute flare-up of sepsis occasionally occurs, and at present appears to be unavoidable; it is common to all types of cleft-palate operations.

"Summary: Best age from 1 to 3 years, depending on type of cleft. Careful attention to the preliminary cleansing of the mouth. Removal of tonsils and adenoids in every case, not less than four weeks before operation. Perfect flaccidity of the two halves of the palate, secured by long lateral incisions commenced on the lower jaw and carried up outside the soft palate and as far forwards as necessary. Meticulous care in sewing with fine silkworm gut which is non-absorbent and is not absorbed. No tension sutures."

A. D. Davis³ deals with the premaxillary bones in congenital cleft palate. He ridicules the idea of removal of the premaxillary bones in order to bring the soft parts together. "In constructing a normal lip", says Davis, "a normal bony arch is essential. The premaxilla, in these cases, forms the most important part of the arch, and contain tooth-buds of usually two to four teeth."

F. W. Goyder⁴ also draws attention to these points. "A wedge-shaped excision of part of the nasal septum", he says, "accompanied by pressing back the prominent premaxilla, facilitates suture of the lip, and is frequently practised. This inevitably results in tilting of the incisor-bearing segment, and the upper incisors, when they erupt, will be directed backwards, or will lie behind the lower ones". He states that it is not necessary to close both sides of the lip simultaneously. Closure of one side in the first few weeks of life, and of the other about two months later, can be performed without undue tension on the suture lines. This procedure results in normal relation of the upper to the lower incisor teeth owing to the backward pressure of the united lip. Hence no operation on the central segment of the palate is required, for in about two years' time the premaxillary cleft is abolished on both sides, and the remainder of the cleft can be treated at the time judged most suitable.

REFERENCES.—¹*Lancet*, 1925, i, 816; ²*Ibid.* 818; ³*Ibid.* 1924, ii, 749; ⁴*Brit. Med. Jour.* 1924, ii, 615.

FACIAL HEMISPASM. *Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.*

That severe facial palsy is sometimes followed by secondary tonic contracture of the previously paralysed muscles, and that such contracture is an omen of incomplete recovery, has been known to neurologists since the time of Duchenne, of Boulogne, half a century ago. The mechanism of its production was only properly understood when we became aware of the double factor in normal

muscle-tonus, and how the medullated nerve-fibres, besides conveying voluntary impulses, also maintain a condition of active or contractile tonus which adapts the muscle to any given position during its active contraction; whereas the non-medullated fibres, derived from the ganglia of the sympathetic, convey no voluntary impulses, but are distributed to a special variety of undifferentiated muscle-fibres which have a tonic or myostatic function, maintaining the posture in which a muscle or limb is placed, whether passively or after it has been reached by active movement. Secondary facial contracture only occurs in cases of incomplete recovery. During the stage of total facial palsy, when no impulses are reaching them, the muscles are quite flaccid. The development of tonic contracture indicates that nerve and muscle regeneration are imperfect.

Paroxysmal facial hemispasm is quite a different affair from tonic facial contracture, although, as we shall see, it is sometimes combined with it. Facial hemispasm consists in waves of flickering fibrillary movement, sometimes localized to the orbicularis oculi, sometimes to the angle of the mouth, and in severe cases affecting all the muscles on one side of the face. The paroxysms closely resemble the contractions produced by faradic stimulation, and are peculiar in the fact that they implicate certain facial muscles which are incapable of voluntary isolated innervation. Thus, for example, the chin may become unilaterally dimpled, or the tip of the nose may be pulled over towards the affected side.

Several varieties of facial hemispasm are met with in practice. One group is characterized by the presence, in the interparoxysmal period, of facial contracture or hypertonicity as above described. This group, whose prognosis as to spontaneous cure is unfavourable, comprises various organic lesions of the facial nerve. Some of these occur before paralysis has supervened, e.g., in tumours of the cerebello-pontile angle or abscesses in the neighbourhood of the facial nerve. Other cases, much commoner, occur during the stage of incomplete recovery after ordinary facial palsy, since the non-medullated nerve-fibres, as is well known, regenerate much more readily than the medullated pyramidal fibres. Luisa Levi,¹ of Turin, records a series of four such post-paralytic cases, and notes that in them the hemispasm is overshadowed to a large extent by the permanent contracture, and that the spasmodic clonic movements are temporarily inhibited by energetic voluntary movement, but tend to appear with increased rapidity after voluntary movements have ceased.

The second class of facial hemispasms is characterized by the absence of tonic contracture, and by the fact that the spasms cannot be inhibited by voluntary movements; moreover, they are less rhythmic and more irregular than in post-paralytic cases. Such cases have a more favourable prognosis. They occur in irritative lesions of the facial nerve, with special stimulation of the involuntary, non-medullated, sympathetic nerve-fibres and undifferentiated muscle-fibres, producing movements analogous to the peristaltic movements of non-striped muscular organs.

Treatment of primary facial hemispasm, unaccompanied by facial contracture or facial palsy, has been carried out by various methods, including the well-established plan of *Injecting Alcohol* into the stylomastoid foramen, thereby inducing a temporary facial palsy. The palsy clears up, but the voluntary movements when they reappear are unaccompanied by the former hemispasm. Negro suggests that this is because the sympathetic fibres of the facial nerve are situated at the periphery of the nerve-trunk and are thus more readily reached by the alcohol. Negro and Levi prefer the method of '*Electrolytic Decortication*' of the facial nerve, in which the perineural

sympathetic fibres are said to be destroyed by the negative electrode, leaving the central, medullated, voluntary nerve-fibres unaffected, and thus avoiding even a temporary paralysis.

REFERENCE.—¹*Presse méd.* 1924, Aug. 19, 667.

FACIAL IRRITABILITY (Chvostek's Sign). *Reginald Miller, M.D., F.R.C.P.*

This well-known phenomenon is elicited by giving a light sharp tap on the cheek midway between the angle of the mouth and the angle of the jaw. When positive this mechanical stimulus produces a lateral twitching of the upper lip, the side of the nose, and the eyelids. It is generally recognized that this sign demonstrates the presence of active or latent spasmophilia (convulsions, tetany, or laryngismus). C. McNeil¹ has investigated the sign in some 400 infants and children. He concludes that the clinical significance of facial irritability is very different in infancy (up to 2½ years) and in later childhood. In infancy there is a definite association between facial irritability and spasmophilia, its presence indicating that spasmophilic convulsions (one or more kinds) have recently occurred or may occur in the future. In the great majority of cases of spasmophilia he finds bony rickets to be present, but the severity of the bony changes is an unreliable guide to the danger of active spasmophilia. In one-half of his cases of bony rickets he found Chvostek's sign negative. He regards the sign as associated with disordered calcium metabolism in rickets.

In older children the sign has in most cases no definite or serious pathological significance. Its presence does not indicate a neuropathic constitution or any recognized functional or organic nervous disease. It does not indicate that general convulsions have occurred or are likely to occur. Cases of asthma do not show it. It is met with most frequently in cases of disordered digestion, including cœliac disease (q.v.).

REFERENCE.—¹*Edin. Med. Jour.* 1924, Dec., 651.

FEET, PAINFUL.

E. W. Hey Groves, M.S., F.R.C.S.

This is a subject which merits a general review, not because of new work which has been done in connection with it, but because of its complexity and practical importance.

Preliminary Observations.—There is no symptom so important to treat, but none which is so difficult to understand, as pain. Whilst in many cases the cause of pain is obvious—e.g., after trauma—yet in many it is very obscure, and it may be laid down as a general principle that the difficulty of treatment is in direct proportion to the obscurity of the cause—certainly this is the rule with painful feet. A hallux valgus with a bunion, or a traumatic flat-foot after a badly treated Pott's fracture, are simple matters—the remedy is just as obvious as the cause. But the flabby foot of a neurotic young woman, or the old flat-foot which becomes painful after many years of silent deformity—these are the instances of really difficult cases both to understand and to cure.

Whilst it is true to say that deformed feet are not necessarily painful, yet it is clear that deformity and pain are often associated. These remarks apply especially to flat-feet. The feet of children and of races that never wear shoes are often quite flat, but both muscles and ligaments are sound, the body can easily be raised on tip-toe without pain or effort, and no special treatment is required. But flat and abducted feet, and those in which the power to rise on the front of the foot has been lost, are most prone to painful symptoms sooner or later.

Perhaps the first consideration in examining a painful foot, especially when the history of the pain is short and severe, is to determine the presence of

active disease apart from mere static deformity or foot-strain. Traumatic conditions are seldom missed, but X rays should be used as a routine to determine the presence of an unsuspected fracture of one of the metatarsal bones or of the os calcis which may greatly prolong the recovery after a blow. Osteo-arthritis is also manifest by X-ray examination, whilst tuberculosis and rheumatism—especially of the gonorrhœal form—are usually evident from a general consideration of constitutional and local signs. So long as there is any doubt as to the cause and nature of acute pain in the foot, it should be treated by rest until the diagnosis has been cleared up, and the same applies to pain which is strictly localized to one tender spot and associated with swelling. No harm is done if a case of acute foot-strain is regarded as one of tubercle or gonorrhœa and treated by rest; but irremediable damage results if a case of one of the latter diseases be allowed to walk, even with special boots or supports.

It may be well, therefore, before going further, to classify cases of foot pain, according to the associated cause. In the main it is of importance to distinguish three groups, viz., cases due to organic disease, those of foot-strain associated with deformity, and those of obscure nature in which no structural abnormality can be discovered.

Causes of Painful Feet.—

1. Organic disease or injury. *

- a. Inflammatory: Sepsis from foreign bodies, whitlow, wounds, etc., rheumatism, gonorrhœa, osteo-arthritis.
- b. Traumatic: Fractures and dislocations and their sequelæ. Sprains, subluxations, and ruptured ligaments.
- c. Tuberculous disease: Bones, joints, tendon sheaths.
- d. Vascular: Endarteritis obliterans, senile gangrene, Raynaud's disease, after frost-bites, 'trench feet'.

2. Foot-strain associated with deformity.

- a. Flat-foot: Loss of longitudinal arch, abduction, pronation. Acute. Chronic. Mobile or fixed.
- b. Loss of transverse arch.
- c. Claw-foot.
- d. Toe deformities: Hallux valgus rigidus and flexus. Hammer-toes. Deformed small toe.
- e. Minor factors: Boots, corns. Spasm and cramps. Bone spurs. Apophysitis. Abnormal sesamoid bones.

3. Without apparent structural basis.

Acute foot-strain. Neuroses. Certain cases of metatarsalgia.

The present article is concerned mainly with the second and third groups of cases, i.e., painful feet associated with deformity or neurosis.

Signs and Symptoms of Foot-strain.—Apart from any associated deformity, foot-strain itself produces well-marked signs and symptoms. In its more acute form it comes on after undue or excessive exercise, or after an illness when the patient first begins to use his feet. Nurses in the early part of their training, recruits after long marching, and sedentary students who take strenuous walking holidays, are common victims. After any acute or chronic illness, e.g., rheumatism or influenza, particularly in the case of a fat and flabby patient, foot-strain is very liable to come on when he begins to walk. Complaints of pain at such times are liable to be ignored; and if the patient is determined to 'stick it' rather than to give in, great and permanent harm may be done.

The pain is definitely related to over-exercise, not only in its origin, but in the fact that it is relieved at once by rest, massage, and bandaging. There is

a dull aching pain along the sole of the foot, together with a bursting sensation as though the boot was too small. There are usually points of maximum tenderness, over the tubercle of the scaphoid and the heads of one or more of the metatarsals. Associated with the pain and tenderness there are certain vasomotor and nervous phenomena. The feet may be either cold or, more frequently, they are hot and sweating. Cramp occurs in any of the sole or calf muscles, but especially in the peronei.

Painful Flat-feet.—As already stated, a mere loss of the longitudinal arch of the foot is not necessarily a condition requiring treatment. But the painful flat-foot usually is also a valgoid foot, showing abduction and eversion as well as a dropped arch. From the point of view of treatment, such feet may be divided into three groups. The first group is that of acute foot-strain, and there may be little or no deformity, but exquisite pain on standing or on pressure over the scaphoid tubercle. In the second group the condition is chronic and of long standing, but the foot still remains mobile; that is, it can be restored to normal shape by passive manipulation. The third group is the rigid flat-foot in which the deformity is fixed.

Acute Foot-strain.—For this condition, whether associated with marked deformity or not, rest is the paramount necessity. In a recent case three or four weeks may be enough to effect a cure; but unfortunately the young active adult—e.g., a nurse who has recently begun her work, or the student who has over-exercised—will seldom submit to anything like this long period of bed. The period of rest is too often shortened and the rest is incomplete; i.e., it stops short of never putting the foot to the ground. Massage, contrast baths, and firm bandaging or strapping should be used towards the end of the month's rest, and a pair of tilted shoes should be got ready before the feet are put to the ground.

Mobile Flat-foot.—For mobile flat-foot, which represents the common type of case, the principles of treatment consist in appropriate exercises and correct foot-wear. The exercises are essentially those of voluntary correction of the deformity, i.e., walking on tip-toe with the toes turned inwards; walking along a straight line, the toes crossing the line on every step. But here, as in prescribing rest for the acute condition, the prescription is easily written but carried out with difficulty. Exercises of a formal gymnastic character become irksome and are soon discontinued, and in dealing with adults it is better to direct attention to the kind and type of active exercise which should be advised or discouraged. Rational treatment demands a suitable combination of active muscular exercise with rest and the avoidance of passive strain. Ideal exercises are swimming, cycling, or rowing, in which foot-work is not accompanied by any weight-bearing. Other active exercises, e.g., tennis or dancing, are only good if taken for short periods without undue fatigue. If dancing could be taken for one hour three times a week it would be good, but taken for four or five hours on end it is bad. The type of exercise which is most harmful is that which involves weight-bearing with but little movement. A shop assistant standing at a counter, and the person who spends several hours gazing at shop windows or pictures, afford illustrations of this.

The adjustment of the shoes is essential, and is often the only part of the treatment which can be enforced. Apart from the ordinary rules of shoe-fitting, e.g., correct fit, straight inner edge, avoidance of narrow, pointed, or short shoes, there are two devices commonly used for painful flat-feet, viz., the arch support and the tilted sole. Of these the former is much more popular, because it can be put into any shoe without affecting its external appearance. But the arch support, whether metal, leather, or rubber, is often very disappointing in its relief of pain. It is obvious, if there is great tenderness over

the scaphoid, that a solid mass in the waist of the shoe which presses up against this bone will not be tolerated. Probably, therefore, the arch support should be reserved for the later stages of treatment or for mild cases, and main reliance must be placed upon tilting the soles of the shoes. The object of this tilting is to relieve the inner side of the foot from strain and to throw the line of weight more on to the outer side. It should be explained to the patient in order to reconcile him to the necessary shoe alteration. At first it may be enough to add a piece of leather to the inner edge of the sole and heel, so as to tilt the foot outwards. This may be done on an old pair of shoes until the patient has become used to the adjustment and until the best degree of tilting has been found. Then a new pair may be made with the tilting incorporated into the leather of the sole. The fault usually made is that, not understanding the principle concerned, the bootmaker puts too small a tilt with the idea of preserving the appearance of the shoes. The actual angle of tilting should be not less than 5° , and in bad cases at an early period it should be as much as 10° . This means that one edge of the sole must be $\frac{3}{4}$ to $\frac{1}{2}$ in. thicker than the other in an adult. When the best angle has been found, then several pairs of shoes should be made, so that the patient is never on his feet without them. In the case of young ladies who will not tolerate shoes which have any external appearance of 'a surgical' character, the best type of foot-wear is a shoe which is only tilted by a $\frac{1}{4}$ -in. thickening on the inner edge of the sole and heel, and to which a cork insole, wedge-shaped on transverse section, is added to the inside of the shoe. The action of the latter is then of value in helping to tilt the foot outwards.

The Painful Rigid Foot.—When the foot has become fixed in a flat valgoid position, it presents a great difficulty. Old cases in which final ankylosis is likely to take place, and cases which have not much pain, are best left alone. The type of patient who has this foot is usually one who cannot afford to give it prolonged and careful treatment. But there is a certain group of cases on the border-line of intractability which it is worth while trying to restore at any rate to some degree of comfort. The rigid foot must be converted into the mobile foot by one or more forcible wrenchings under anaesthesia, followed by plaster cases, and then by strapping, and lastly by massage. Such treatment may take weeks or months, but even one wrenching is sometimes followed by relief. When the foot has been forced into better shape, so that it can be held with the toe pointing forwards and the sole inwards, the tilted shoes must be provided and the general treatment be conducted as for the ordinary mobile flat-foot.

To summarize briefly the common types of painful flat-feet and their treatment:—

Acute foot strain, with or without deformity: Treat by rest, bandaging, massage.

Mobile flat-foot: Treat by exercises and tilted shoes.

Rigid flat-foot: Treat by wrenching, and then as in the last group.

Spayed Feet: Loss of the Transverse Arch.—The spreading of the front of the foot with loss of the arched disposition of the metatarsal heads is perhaps quite as common a cause of foot pain as the ordinary flat-foot with loss of the longitudinal arch. Its nature is easily recognized by the way in which, when the patient puts his bare foot on the ground, the front of the foot spreads itself out, becoming much wider. Usually the toes are crowded together, the big toe pointing out and the little toe in. But it is in the early stage of this condition, before gross deformity has occurred, that pain is most conspicuous, and it is precisely at this stage that relief can be given by appropriate treatment. The most natural way of treating such a condition would seem to be the

provision of a strap or band to encircle the necks of the metatarsals and so keep them braced together; but though a firm bandage at night may be a relief, it is very seldom that a strap can be tolerated during the day.

The only method of treatment on which any reliance can be put is that of providing some sort of a support for the middle sunk portion of the arch. Whether such a support acts by virtue of restoring the arch, or by merely keeping the middle metatarsal heads from pressing on the ground, is a matter of doubt. The essential points are that the pad shall be of the right size and thickness and applied at the correct spot. Metal or leather supports made in stock sizes and sold at bootmakers' may by good chance be of the correct size and shape, but more likely they are not. It is far better at first to cut out the pad from cork or adhesive felt, taking great pains to get that thickness and size and position which give most relief. The cork pad must be fixed to an insole; the felt can be made to stick to the foot itself. It should be shaped as in *Fig. 16*, wide enough to cover the necks of the three middle metatarsals, and thickest at the back and thin at the front. The patient will very soon learn the exact thickness which gives her the maximum relief.

Painful Heels.—Pain localized in the heels will be easy or difficult to treat in proportion to the definiteness of any morbid condition which is associated with it. The X rays may show more or less well-marked spurs under the os calcis. Such a spur is situated at the attachment of the plantar fascia. It probably results from fibrositis, and its removal is followed by relief of pain. In slight cases a cork sole hollowed out over the spur may be tried first. In definite foot deformities, e.g., talipes calcaneus or pes cavus, the pain in the heel will be due to the more vertical position of the calcaneum, and the treatment will consist in the correction of the deformity. But there are other cases again, and these occur chiefly in young patients, where no morbid condition can be found. Certain of these are probably neurotic in origin, but others may be due to foot-strain or fibrositis which gives no X-ray evidence. If rest followed by the use of cork soles cupped over the tender areas do not cure the condition, it is worth while to turn a heel flap forward and to separate the origin of the plantar fascia and short muscles from the under surface of the os calcis.

Painful Toes.—Painful toe conditions are usually associated with splayed feet or with pes cavus; but the toe condition may be primary, and is then generally due to wearing boots too pointed or too short. Painful deformity of the metatarsophalangeal joint of the great toe is usually associated with osteo-arthritis and rigidity, the deformity itself being either a hallux valgus, rigidus, or flexus. In such conditions some form of excision of the metatarsal head, covering the raw bone surface with a fascial flap, is indicated. This must be followed up by a boot with a straight inner edge and a toe-post or hallux valgus spring to keep the toe adducted. Needless to say, if a bunion, i.e., an adventitious bursa, exists over the deformed toe, this will afford additional reason for operative treatment. Hammer-toes, whether associated with claw-foot or not, should be treated by excision of the head of the first phalanx and transplantation of the long extensor tendon to the neck of the metatarsal, where it will act by raising the front of the foot instead of buckling up the toe. Painful little toes should be removed, but in the case of the other toes removal should never be done on account of pain or deformity, because

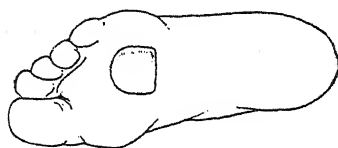


Fig. 16.—Pad for splayed foot.

the great toe is essential for walking, and removal of any of the other toes except the fifth will allow the great toe to become abducted into a valgoid position.

Painful Tendons.—There are two tendons in the foot which may be the chief cause of painful conditions—the tendo Achillis or the tendon of the peroneus longus. Painful tendo Achillis may be associated with obvious swelling and tenderness of the bursa which underlies it. Rest, followed by iodine or other counter-irritation, will be indicated. Very rarely will excision of the bursa be called for. A short tendo Achillis which does not permit dorsiflexion beyond a right angle is frequently associated with painful feet. Simple tenotomy should be avoided, because its results are difficult to regulate. Either the tendon will rapidly join and the original condition recur, or else it stretches too much and a weak foot results. Either the tendon should be stretched by repeated wrenchings followed by a plaster case, or else it should be lengthened by a Z-shaped tenotomy through an open incision. Peroneal spasm may be a most conspicuous feature in certain types of flat-feet in young patients. It is recognized by the acute pain running up the line of the fibula, caused by any attempt to adduct the foot. It is to be treated by simple tenotomy, followed by over-correction of the valgoid position, with retention by plaster.

Metatarsalgia and Conditions of Neurosis.—Severe pain in the front of the foot may be associated with a dropped transverse arch, and this condition has already been dealt with; but true metatarsalgia may be present in its most acute form without any deformity. Its nature is very obscure. The spasmodic character and the severity of the shooting pain suggest that it is of a neuralgic type, and it is commonly ascribed to pressure on the digital nerves between the metatarsal bones or between these bones and the ground. Neither explanation carries any conviction to the unprejudiced mind. The nerves are small, and there is ample space between the bones for their accommodation. The pain is not cured either by division of the posterior tibial nerve or by excision of the heads of the metatarsal bones; at least, that is the experience of the writer. It is much more likely to be due to a vasomotor disturbance, and it would be a much more rational and less harmful procedure to do a perivascular sympathectomy after the suggestion of Leriche, than to carry out the above-mentioned procedures. In any case the use of a metatarsal pad as in the dropped arch should be tried, and general hygienic measures adopted to improve the foot circulation, e.g., graduated exercises, and especially swimming.

Shoes for Painful Feet.—Apart from special devices, e.g., tilting the sole, crooking the heel, or using arch supports, there are certain well-known rules for shoes to prevent deformity and to ease painful conditions. The shoe should fit the foot both in size and shape, and for adults at any rate it should be made on a special last constructed from a plaster cast of the foot. The common faults in shoes to be avoided are shortness, pointed toes with curved inner margin, and high heels. The shoe must be long enough and wide enough to allow all the toes to lie down flat side by side. The inner edge of the sole must be straight, so as to allow the great toe to lie in a line with its metatarsal. A point may be given to the shoe, but it must lie in front of the lines of the toes. The matter of the height of the heel is not so simple. If people never wore shoes or boots they would not suffer from the common foot troubles. But it is impossible to deprive a person who has been accustomed to it of the heel of the shoe without causing him discomfort or fatigue. Any normal person can convince himself of this by attempting to take a long walk in rubber-sole shoes which have no heel. A heel of moderate height, i.e., about 1 in., should therefore be allowed. A heel higher than this throws too much of the

weight forward on to the toes, and crowds them together into the front of the shoe. The heel should be as broad as the foot, so as to give firm support without the necessity of constantly balancing on a point, or the danger of twisting the ankle.

FEMORAL SHAFT, EXPOSURE OF. (*See HUMERUS AND FEMORAL SHAFT.*)

FEMUR, FRACTURES OF THE UPPER END OF. (*See also FRACTURES.*)

Sir W. I. de C. Wheeler, F.R.C.S.I.

*Fractures of the Neck of the Femur in Children (Slipped Epiphysis).—*First importance attaches to the partial fracture-separation of the epiphysis of the head of the femur. The condition is most often found in or about puberty, more often in boys than in girls. It may arise out of some comparatively trivial and forgotten trauma. Any displacement which occurs may be gradual, the diaphysis yielding in an upward direction and becoming gradually rotated outwards in relation to the head. Solid union takes place, leaving behind a traumatic coxa vara. It is a difficult injury to diagnose early, even with the help of X rays, and Sir Robert Jones says it is the most often overlooked of all hip injuries, even by extremely good surgeons. It is suspected when rotatory movements are extremely painful, and when abduction beyond a short range is impossible. There is, at first, no shortening, and the symptoms disappear with rest; but later on, when activities are resumed, shortening occurs, and separation of the epiphysis, partial or complete, will be then recognized. In contrast with this, there may be a complete separation of the epiphysis, a fracture through the neck, or a fracture involving both neck and epiphysis. Whitman calls special attention to fracture of the neck of the femur in children. The fracture occurs after traumatism to the hip, probably more frequently than separation of the upper epiphysis. It is generally impacted or of the greenstick variety, but the signs and symptoms are much the same. The immediate results are good, but yielding at the point of fracture will produce a coxa vara if the limb is not protected from weight-bearing for many months by a caliper splint. The immediate treatment, whatever the position of the fracture may be, is the same as in adults. Shortening and eversion must be reduced, with subsequent fixation in the position of abduction.

To obtain reduction, flexion and inward rotation followed by traction and abduction, or abduction alone, are required. Seven cases of ununited fracture of the femur in early life are mentioned by Whitman, to prove that non-union may follow this injury in childhood if the treatment is inefficient. Thus he shows that non-union is not accounted for by deficiency of blood-supply, nor by advancing years, but by inefficient treatment. Plaster-of-Paris fixation is the best, and after six or eight weeks the child may be allowed to walk on a caliper splint for two or three months. If the fracture is diagnosed and no displacement has occurred, after a short period of rest, ambulatory treatment with a caliper splint is sufficient.

Fractures of the Neck of the Femur in Adults.—From the point of view of treatment it is not necessary to speak of intracapsular fractures and extracapsular fractures, impacted or unimpacted, beyond this—that if, in a strong adult, a fracture is impacted, and there is more than half an inch shortening with eversion of the foot, the impaction should be forcibly broken down under an anæsthetic, the deformity reduced, and the treatment carried on as in unimpacted cases. Rotation outwards of the foot matters much more than a little shortening. If the foot is in good position without any outward rotation, and the shortening is inconsiderable, then it is not necessary to disimpact. If there is impaction in an old person, all the circumstances must be carefully

weighed before the impaction is broken down to reduce moderate deformity; but it must be remembered that the so-called impacted fracture from indirect violence in elderly people is very incomplete, and functional disability will certainly follow weight-bearing in the absence of proper reduction. A decision must be made as to whether, in an exceptional case, the risk of reduction and fixation is too great. Under such circumstances crippling, non-union, and deformity must be the result, mitigated to some extent if a caliper splint can be worn.

The object of treatment of this, as of all fractures, is to restore the symmetry of the broken bone, thus eliminating the primary cause of non-union, deformity, and loss of function. Henderson states that of 120 cases of ununited fracture

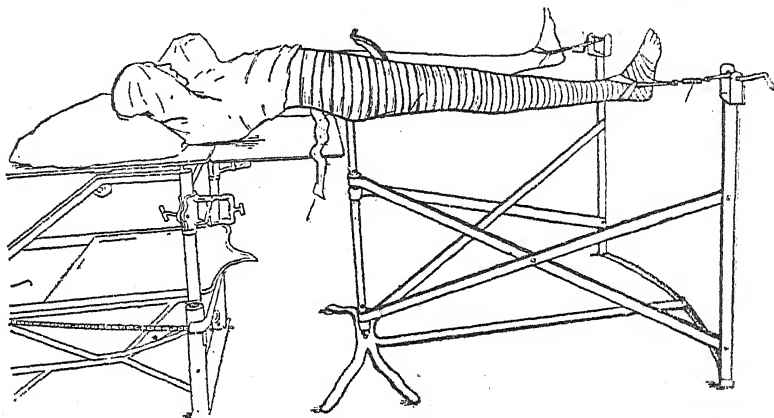


Fig. 17.—Simple orthopaedic table (designed in 1905) for treatment of fractures.

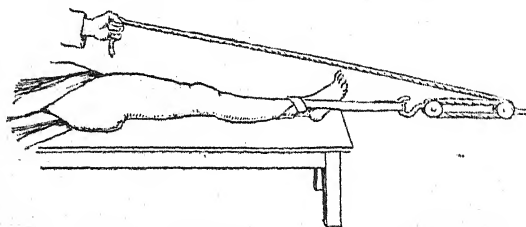


Fig. 18.—Block and tackle extension (Jones).

of the hip seen at the Mayo Clinic, not one had received proper treatment at the time of the injury.

It is a pity that so many years were wasted in treatment of fractures of the hip on basic principles different from other fractures, stress being laid on theoretical considerations which very often were without substance. The success of the modern treatment can be summarized in one sentence—reduction of the deformity with fixation in the abducted position. Whitman deserves due credit for insisting upon these conditions. It may be confidently predicted that the immediate and efficient treatment of fractures of the neck of the femur by the abduction method will be followed, in most instances, by repair. If union fails when accurate apposition of the fractured surfaces has been maintained for a sufficient time—as confirmed by X-ray examinations—it

indicates a low vitality in the tissues, and Whitman advises, in such cases, a reconstruction operation which will be mentioned later.

In 1903² the writer designed an apparatus for the reduction of all fractures of the lower extremity which resisted manual traction, and in the absence of one of the more perfect tables of the Hawley type it is useful. The original cost was £2 10s. The apparatus consists simply of two iron gates, about 4½ ft. long, swung on an upright which carries a perineal bar, attached to which is a small support for the sacrum of the patient, which is included in the plaster, but afterwards removed. This pelvic support and the upright on which it sits are supported by a heavy stand. On the distal ends of the gates are rollers, square in section, in order to obtain a firm hold on the cords or bandages when extension is being applied. By pushing the handle inwards, the square bar fits into a hole of the same shape and diameter, and so locks. This is a simple substitute for a ratchet. Fixed to the stand, and running at right angles to it along the floor between the two gates, is a bar, and the distance of the gates from this bar indicates the exact amount of abduction, and enables plaster to be applied with both legs spread from the pelvis at equal angles. In this way there can be no obliquity of the pelvis. If it is desired to note the exact amount of extension required to hold the fracture reduced, two Salter's sportsmen's balances, registering at least 50 lb., are necessary additions. The illustration (Fig. 17) makes the mechanism clear. It provides a substitute for the block and tackle pulley arrangement (Fig. 18) as a means of reducing the overlapping and shortening, and it facilitates the application of plaster-of-Paris when employed during the treatment.

Reduction of an Intracapsular Fracture of the Neck of the Femur.—The patient is anesthetized. The gates are brought to the end of the table, and the patient is put astride the padded perineal crutch. Manual traction and manipulation are usually sufficient for reduction, but by attaching the foot to the end of the gate, extension and abduction are readily obtained, and the application of plaster-of-Paris rendered very simple. It is best to apply the plaster to the foot and lower third of the leg in the first instance, and, when this has set, a clove-hitch or a wet skein of wool, passed round the ankle and over the foot in figure-of-8 fashion—as recommended by Watson Cheyne—is connected with the ratchet. These connections may be incorporated in the plaster bandages used to complete the cast before the extension is released. Or, alternatively, a steel pin is passed beneath the tendo Achillis in contact with the os calcis to act as a connecting link between the foot and the ratchet. The steel pin is removed when the plaster cast is complete.

The limb on the sound side is held abducted to the normal limit by an assistant who stands at the end of the gate, or it is also extended by a clove-hitch. The surgeon notes the normal range of abduction on the uninjured side. The knee and thigh are kept slightly flexed by a sling under the knee from the upright bar which is attached to the gate (not shown in illustration). This flexion corrects the inversion of the foot. The injured leg is extended by tightening the ratchet, and slowly abducted by moving the gate. The foot is rotated inwards. The surgeon or an assistant supports the joint, and presses the trochanter gently downwards. The neck of the bone is first felt to hitch on the upper border of the acetabulum, but this obstacle is easily overcome. Abduction is continued until the normal range is obtained. The trochanter rests against the side of the ilium, and the anatomical relationship between the shaft and the neck of the femur is now restored. The limb is in the Whitman attitude of extension, complete abduction, and slight inward rotation. Plaster-of-Paris is rolled on with great facility with the aid of this apparatus. The plaster is allowed to dry with the patient still in position on the gates.

In the ward, the head of the bed is raised one or two feet, an inclination the reverse of that required for traction. It is more comfortable, and Whitman thinks that the influence of this position on the blood-supply makes the chances of repair more favourable. The spica is retained in position for from eight to twelve weeks, and several more weeks are spent in bed for treatment with massage and the restoration of movements in the joints. Weight-bearing is not permitted until the movements of the joints are free and painless, and X-ray photographs indicate the stability of repair.

Jones treats these cases on his abduction frame slightly modified. In very feeble patients who are bad surgical risks, a Thomas's splint slung out over the side of the bed is substituted (*Plate XVI*), the sound leg being kept in abduction by sand-bags or an additional Thomas's splint. Waldenstroem³ says there is a marked difference between the results obtained when the fracture is held by a plaster cast and when it is held by extension. When a plaster cast was used, out of 15 cases 11 gave good results, 8 with bony union. In 13 cases treated by extension methods, there were 3 good results; bony union resulted in 2.

The treatment of fractures of the neck of the femur can be summarized as follows: (1) In all subjects, of whatever age, reposition of the fragments should be attempted, unless the patient is too frail for treatment, and then the fracture must be neglected. Sometimes, but not often, such a

patient can endure walking on a caliper splint, but in the majority the rest of their lives will be spent either in bed or in a chair. (2) When the fracture is reduced under anaesthesia, a plaster-of-Paris splint, as described by Whitman (*Fig. 19*), is the most effective appliance. (3) To apply a plaster case properly for this fracture, some sort

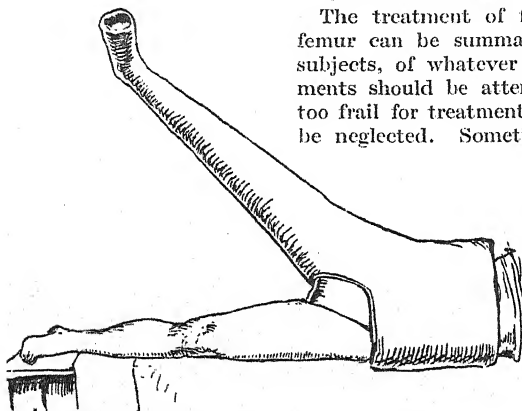


Fig. 19.—Completed plaster case (after Whitman).
(Figs. 17-19 by kind permission of the 'Lancet'.)

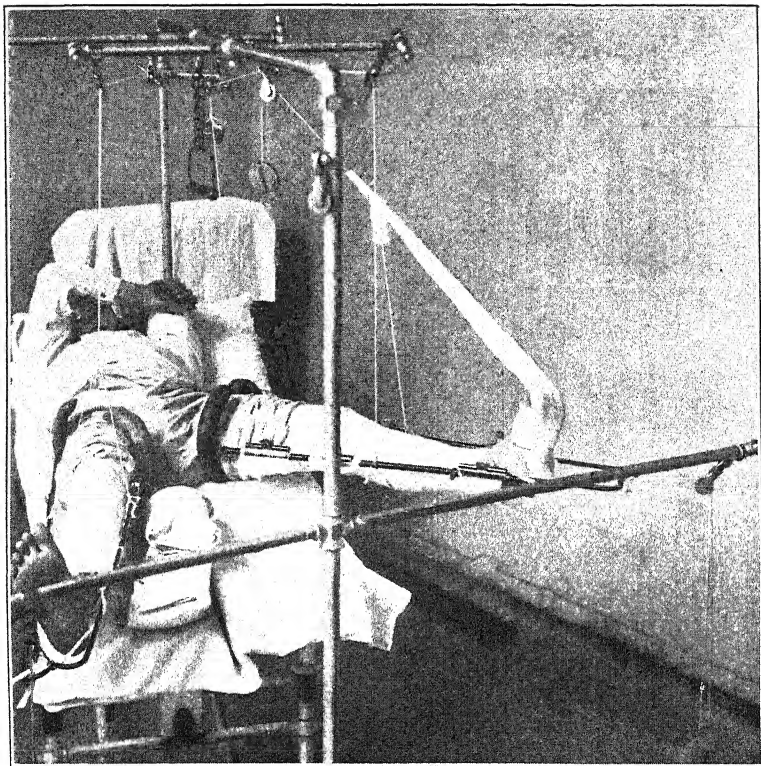
of orthopaedic table is most desirable, but a perineal prop with pelvic support which clamps on to any table gives immeasurable help. (4) In the absence of a perineal prop, counter-fixation of the pelvis during reduction is accomplished by passing a strong bandage round the groin on the sound side, and tying it to the table near the patient's head. (5) In cases unsuitable for plaster, good abduction and extension can be maintained on Jones' frame, or the injured limb may be slung in a Thomas's splint in abduction over the side of the bed, and tilting of the pelvis prevented by supporting the sound leg in abduction with sand-bags. (6) The position of abduction should be maintained for at least two months.

Fracture of the Trochanters.—In subjects under 18 years, epiphyseal separation of the great trochanter is not uncommon. Fracture of the great trochanter is rare. When it occurs, the trochanter is displaced upwards, and the best apposition can be obtained by the abduction method of treatment.

REFERENCES.—¹Wheeler, *Lancet*, 1925, ii, 313 and 363; ²*Med. Press and Circ.* 1905, March 8; ³*Jour. de Chir.* 1924, Aug., 129.

PLATE XVI.

FRACTUR OF THE FEMUR

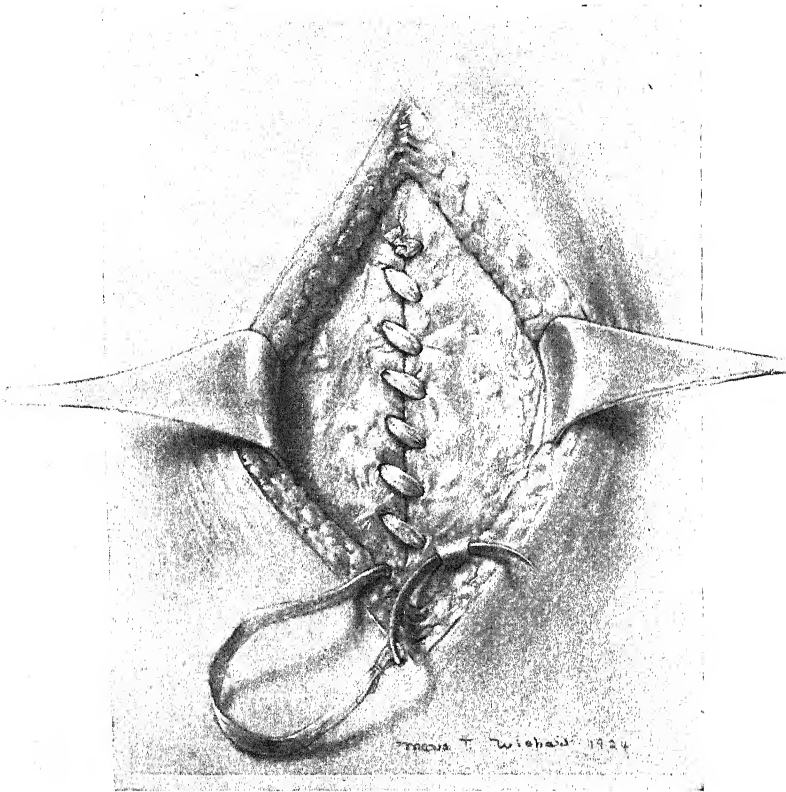


Fracture of the femur (upper third and neck). Patient in bed after reduction.
Note gauze glued to sole of foot to support it at right angles.

By kind permission of the 'Lancet'

PLATE XVII.

FIBROUS TISSUES IN REPAIR OF ANATOMICAL DEFECTS



Repair of ventral hernia with sutures of fascia lata. Insertion of the first row of sutures which brings the edges of the defect together or as nearly together as they will come without great tension.

By kind permission of 'The British Journal of Surgery'

FIBROUS TISSUES IN THE REPAIR OF ANATOMICAL DEFECTS.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Under the above title, W. E. Gallie and Le Mesurier¹ give a very full discourse, and show the uses made of strips of tendons and strips of fascia in the repair of injuries to tendons and ligaments, in certain ununited fractures, paralytic deformities, etc. The reviewer has used successfully transplants of deep fascia from the outer side of the leg to repair defects in the chest wall, and to give support to lung hernia, and also has used a strip of the same fascia, on the recommendation of Mr. Rendle Short, to perform Clairmont's operation for recurrent partial dislocation of the shoulder (see MEDICAL ANNUAL, 1925, p. 232). Plate XVII from Gallie's paper illustrates the use of fascia in suturing.

REFERENCE.—¹*Brit. Jour. Surg.* 1924, xii, Oct., 289.

FILARIASIS.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

L. Tanon¹ refers to the partially successful treatment of *Filaria bancrofti* by himself and Girard with arsenical preparations and by Rogers with antimony tartrate, and he now reports having obtained successful results in several cases with subcutaneous or intramuscular injections of Heetline every other day for twenty days, and after an interval of twenty days ten more injections, in doses of 0.1 to 0.2 grm., up to a total of 2 grm. in light cases and 3 grm. in more highly infected ones. The embryos rapidly decrease in the blood, and any symptoms present improve, including considerable decrease in the size of elephantoid lesions, chyluria also clearing up, and eosinophilia disappearing. G. C. Low and W. E. Cooke² report a negative result from a trial of Bayer 'G. 1919' in a case of the same disease.

Dracunculus medinensis.—N. H. Fairley³ deals with the methods of Extraction of guinea-worms, and describes a new operation for the purpose. The position of the worm is first located, when necessary, by applying ice, or preferably a spray of ethyl chloride, locally, to produce a contraction of the musculature of the worm, making it prominent or palpable where not previously so. When the blister has ruptured and extrusion already commenced, he advises extraction at one or two sittings by intermittent traction, accompanied by massage in the direction of the sinus, the limb being placed so as to relax the muscles. When the worm is lying closely convoluted in a limited area of tissue it may be excised *en masse*; but otherwise, after localization, two or more small transverse incisions are made across the length of the worm, and loops pulled out with a strabismus hook, cut across, and the pieces of the worm withdrawn from these openings and from the sinus, the latter being disinfected with 1-20 carbolic to prevent secondary infection. The urticarial, erythematous, or asthmatic prodromal symptoms are relieved by an injection of 10 min. of 1-1000 Adrenalin Chloride.

REFERENCES.—¹*Presse méd.* 1925, Feb. 28, 265; ²*Lancet*, 1924, ii, 903; ³*Ind. Med. Gaz.* 1924, Sept., 429.

FLAGELLATE DIARRHŒA. (See DIARRHŒA, FLAGELLATE.)**FLAT-FOOT.** (See FEET, PAINFUL.)**FOOD POISONING, ACUTE.***William G. Savage, B.Sc., M.D.*

Food may give rise to acute illness either because it contains living bacilli which produce toxic substances within the alimentary tract, because it contains the toxic products of certain bacteria, or on account of being admixed with poisonous chemical substances not of bacterial origin. In addition, in rare cases symptoms of illness may arise, owing to an inherent susceptibility of

the individual, from the ingestion of foods which are without harm to the ordinary person. Such a definition would include acute bacterial specific infections such as typhoid fever, paratyphoid fever, and cholera, but for convenience these are not included under the term acute food poisoning. While therefore no precise definition is practicable, these conditions comprise a fairly definite group of illnesses. Their etiology is complex, and since the clinical features are largely determined by the cause, a study of acute food poisoning is best approached in relationship to causation.

CAUSATION.

Many varieties have to be recognized. They may conveniently be grouped into the following :—

FOOD ALLERGY.—In these cases the food is sound for the normal individual, but owing to inherent or acquired idiosyncrasy it acts as a toxic agent for particular individuals. The most generally accepted view is that this special susceptibility is due to a sensitization of the individual, a condition allied to anaphylaxis. The symptoms which occur are sometimes gastro-intestinal; in others, various skin affections such as urticaria, erythema, or eczema are predominant. In some cases dyspnoea and asthma are the prevalent symptoms. The majority of the foods which possess this peculiar property are protein in nature. The commonest is egg-albumen, while other foods are fish, cheese, tomatoes, pork, shellfish, etc.

NON-BACTERIAL CHEMICAL POISONING.—From time to time, and usually in connection with some stage of preparation of the food, admixture with poisonous chemical substances may occur. Two examples may be given :—

1. A mild outbreak of metallic poisoning in October, 1922, affecting 200 out of 450 able-bodied men at an institution in Sutton. The symptoms were colic, dizziness, stiffness of the throat, vomiting in a few cases, but no diarrhoea or double vision. They occurred directly after eating apples stewed for rather over two hours and served hot. Only 10 men were at all seriously upset, and all went to work next day. The apples were stewed in galvanized iron pans, and the stewed apples were found to contain 7 grains per pound of zinc, expressed as zinc oxide. On an average each inmate consumed the equivalent of 18 to 20 gr. of zinc sulphate.

2. Three persons in May, 1921, after partaking of roast stuffed breast of mutton and potatoes, became ill with dryness of the mouth, giddiness, weakness of the limbs, and disturbance of vision, starting about ten minutes after eating the food. Considerable amounts of atropine were isolated from the sage stuffing. The outbreak was located to the use of dried herbs which had become accidentally mixed with belladonna leaves owing to both growing together.

Chemical outbreaks of this character are relatively rare, and can usually be detected by the very short incubation period and by the characteristic symptoms of the chemical poison.

THE TOXIC ACTION OF CERTAIN DEFINITE BACTERIA.—These bacilli can be grouped as follows :—

1. *B. Botulinus*.—Causes the type known as botulism, described below.

2. *Salmonella Bacilli*.—All recent investigations demonstrate that certain members of this group are the most important causes of food poisoning. The subject is of considerable complexity, and outbreaks of this type are separately considered below.

3. *Dysentery Bacilli*.—Until quite recently these bacilli were not recorded as associated with food-poisoning outbreaks; but Savage and Bruce White, in their series of 100 consecutive outbreaks, include four in which the organisms concerned were true or closely allied strains of dysentery bacilli. The symptoms in these outbreaks were in almost every case definitely of the food poisoning salmonella type, and were not dysenteric in character. In their

ordinary features they do not differ from the salmonella type of outbreaks, and need not be specially considered.

4. *Indeterminate Bacterial Action*.—While the majority of food-poisoning outbreaks are associated with bacteria of one of the above groups, there is a number in which the nature of the infection has remained unexplained, and we are not in a position to assert that all have the above causation. Probably a few other types will be isolated. Apart from these, however, the possibility of *B. coli*, *B. proteus*, and other putrefactive types being associated with food poisoning demands notice. The view that food poisoning is in many cases associated with putrefactive changes in the food—a conception enshrined in the name *ptomaine poisoning*—is deeply rooted, and is copied from text-book to text-book.

There is no evidence of any value that putrefactive changes in meat or other foods have ever caused an outbreak of food poisoning, although it is probable that the consumption of incipiently putrefactive food might disagree with individuals and cause symptoms of malaise. The records of outbreaks include a number in which *B. coli*, and particularly *B. proteus* (a highly putrefactive bacillus), have been specifically given the credit of originating the outbreak. The writer has been at the trouble of consulting the original records of all these *B. proteus* outbreaks that he has been able to find, and for none of them is there any conclusive evidence warranting such an assumption. Indeed, for nearly all, the evidence is entirely valueless. As will be explained below, in the vast majority of food-poisoning outbreaks the food is physically perfectly sound, and if it is putrefactive it is an unassociated secondary change.

As regards ptomaines, these are non-specific toxic bodies produced in any organic matter allowed to putrefy, if the processes are allowed to go on long enough. They are late protein degradation products which are never found in food until it is far too nasty to eat. They are reported as highly toxic, but this is when introduced directly by injection into the tissues, and when fed their toxicity is comparatively low. They certainly have nothing to do with food poisoning, and the term 'ptomaine poisoning' should be relegated to the limbo of unfounded hypotheses.

RELATIVE PREVALENCE OF THE DIFFERENT CAUSAL AGENCIES.—A good deal will depend upon the nature of the series compiled, particularly if all outbreaks are included or only those of severe type. While the facts cannot be stated with precision, a good idea is obtainable from the following table of 100 consecutive outbreaks recently investigated by Savage and Bruce White:—

Outbreaks probably not true food poisoning	3
Outbreaks due to members of the salmonella group ..	66
Outbreaks due to members of the dysentery group ..	4
Outbreaks due to <i>B. botulinus</i>	1
Outbreaks of definite chemical origin	2
Cheese-poisoning outbreaks	8
Mild evanescent outbreaks	9
Outbreaks of undetected bacterial origin	7

100

"Excluding the three outbreaks probably not food poisoning, and including one cheese outbreak as certainly of salmonella origin, this gives 67 out of 97 or 70 per cent, of these food-poisoning outbreaks as due to salmonella bacilli.' When only severe outbreaks are included in any series the proportion due to salmonella strains is much higher. The proportion due to cheese in the above table is higher than in most series. There is still much obscurity as to the causation of these cheese outbreaks. Those first reported were ascribed to *tyrotoxin*; but whatever may have been the etiology of these early cases,

this substance has never been isolated from any of the more recent outbreaks, and it is reasonably certain that it has no connection with cheese poisoning as met with at the present time.

One other special type of food poisoning may be mentioned: that due to the consumption of mussels, usually from sewage-polluted sources. The earlier outbreaks were ascribed to *mytilotoxin*. No recent investigations have been made, and there is considerable doubt as to this poisonous substance being the true cause of the poisoning.

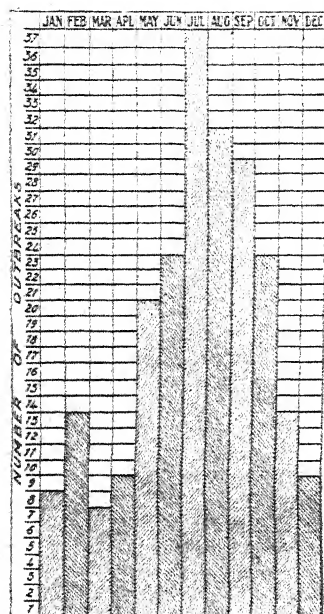


Fig. 20.—Seasonal prevalence of food-poisoning outbreaks.

EPIDEMIOLOGICAL FEATURES.

SEASONAL PREVALENCE.—The chart (Fig. 20) reproduced gives the seasonal prevalence of 222 outbreaks in Great Britain and Ireland of which the writer has particulars. It shows a very definite increased prevalence in the warmer months. When the outbreaks are dissected as regards their cause, this hot-weather increase is especially noticeable for outbreaks caused by living bacilli, while those due to toxins only show but little seasonal influence. This suggests that there is no greater sensitiveness of the alimentary tract in summer, and this prevalence in hot weather is probably associated either with increased virulence of the bacilli or a larger dose due to more rapid multiplication.

PHYSICAL CONDITION OF THE INCRIMINATED FOOD.—It cannot be too strongly emphasized that in the vast majority of food poisoning outbreaks (excluding the rare botulism) the food affected is not noticeably altered in appearance, taste, or smell. The view that the food must be 'tainted' to be toxic is wholly erroneous. Putrefactive changes may have concurrently developed and the food be spoiled; but this is a subsidiary change, and even this is rare.

NATURE OF THE FOOD ACTING AS THE VEHICLE OF INFECTION.—The following table shows this for 203 outbreaks (all British), many of which were investigated by the writer and Mr. Bruce White:—

Nature of Food	No. of Outbreaks	Percentage
Canned meat	31	30.5
Canned marine products	27	
Canned fruit	4	
Milk	14	6.9
Milk products	16	7.9
Made-up meat	54	26.6
Manipulated meat	10	4.9
Fresh meat	33	16.3
Fruit and vegetables (not canned)	8	3.9
Other foods	6	2.9

This table shows what a large part foods which have been made up and manipulated play in food poisoning. They constituted 72 per cent of the whole, and this apart from some of the fresh-meat cases in which some manipulation took place.

INFECTIVITY RATE.—In general this is high, and often all who ate the incriminated food were made ill. In some instances, owing to special reasons, a material proportion escape.

CASE TO CASE INFECTIVITY.—Infection from case to case is very rare in food poisoning, although a few instances are recorded. It is certainly possible, but there is little opportunity for it to occur, as mostly the cases are acute and the symptoms terminate in a few days.

BOTULISM.

This variety of food poisoning is of great importance because of its high case mortality and fatality, but only one definite outbreak (Loch Maree) has been recorded in Great Britain. On the other hand, a good many cases still result in certain European countries, while of recent years many outbreaks have occurred in America, and well over 100 have been reported. Most of our recent knowledge is from American sources.

The organism responsible is *B. botulinus*, a sporing, obligate anaerobe with fairly definite characters. There are several serological types, of which types A and B are definite, while recently a type C has been described. It is one of the few organisms which produce a true extracellular toxin, and this is of extremely high toxicity. The symptoms are entirely due to this toxin, and a true infection with *B. botulinus* does not occur. The spores themselves are harmless unless they are under conditions which allow them to germinate and so produce this toxin.

The American researches indicate that the spores of this organism are fairly widely distributed in nature. They occur in soils, more particularly virgin soils, and have frequently been found on vegetables and fruits brought into the open market, especially upon those bird-pecked or otherwise damaged. They have been found in animal excreta (10 per cent in one series by Easton and Meyer), but not in healthy human excreta. The spores have been isolated from English soils, but their distribution in this country has not been worked out. Botulism is not uncommon amongst fowls in parts of the United States, mainly as a result of feeding with spoiled and toxic canned foods. Certain forms of 'forage poisoning' in horses are probably true equine botulism.

The vehicle of infection varies in different countries. When first described in Germany it was mainly associated with sausages and other meat foods, and pork and fish are still the commonest vehicles on the Continent, especially inadequately pickled or smoked meat foods. In the United States canned vegetables and canned fruits are principally involved. The Loch Maree outbreak was due to an infected glass jar of wild-duck paste.

The toxins and the vegetative bacillus are not of high resistance, but the spores are extremely resistant to heat, and may survive for as long as four minutes at 120° C. The problem of sterilizing canned foods to make them safe as regards the causation of botulism is therefore one of considerable difficulty.

B. botulinus is an organism which breaks down proteins, and in general toxic foods show physical changes of spoilage (especially a definite abnormal odour). Unfortunately, as recent investigations have shown, this valuable criterion is not invariably present, and some foods, such as spinach, olives, and string beans, may pass through a stage in which signs of spoilage are not noticeable but potent toxins are present. In the Loch Maree outbreak no abnormal

changes were observed in the wild-duck paste, although when a sound jar of the same batch was infected with the strain isolated in the writer's laboratory, gas and other obtrusive signs were obvious.

The symptoms* are quite unlike those of other types of food poisoning. While in about one-third of the outbreaks there have been some initial symptoms of gastro-intestinal irritation, these are trivial and evanescent and usually absent. The onset of symptoms is usually eighteen to thirty-six hours after ingestion of the poison, but may be much earlier or considerably delayed. The characteristic symptoms are most conveniently remembered if they are grouped.

Vision and eye disturbances are frequently the first exhibited, while they are practically always present. They may take the form of dimness of vision, double vision, loss of reflex to light stimulation, diplopia; later, loss of accommodation, involvement of the eye and eyelid muscles shown as squint, weakness of the muscles, and ptosis. Throat symptoms include dryness of mouth and throat, difficulty in swallowing and talking, feeling of constriction of the throat, loss of voice. General muscular weakness occurs, while inco-ordination of muscular movements of the arms and legs is common. Nearly as important as the positive symptoms are those which do not occur. Pain is usually absent, constipation (not diarrhoea) is usual; mentality and consciousness usually remain clear until shortly before death; there is no fever, and a sub-normal temperature is common, but the pulse-rate is often markedly increased; respiration is not disturbed, and the sphincters are not affected.

The initial diagnosis of botulism is made upon the symptomatology and the epidemiological features, particularly the high toxicity, which suggests that if several have eaten the incriminated food and only one is affected, the diagnosis is at once suspect. Confirmation is by bacteriological diagnosis, particularly from the examination of the suspected food.

TREATMENT.—The administration of the specific Botulism Antitoxin may be valuable, but probably is useless unless given early in the disease and before definite objective symptoms have developed. It can be obtained direct from the Ministry of Health and from certain special local centres; 20 to 50 c.c. should be given intravenously and repeated daily if necessary. A valuable article upon possible remedies, including the use of ether and alcohol, is contributed by D. L. Sisco (*Boston Medical and Surgical Journal*, 1924, Nov. 27, p. 1023).

SALMONELLA FOOD POISONING.

The salmonella bacilli form a fairly well-defined group which are very closely allied culturally but can be differentiated serologically into a number of quite definite types. Recent work has differentiated nine such types, of which two, *B. aertrycke* and *B. enteritidis*, are the commonest causes of food poisoning, four are occasionally associated with this condition, while the other three appear to have no connection with food poisoning. All the bacilli of this group are non-sporing organisms having no special resistance to heat; but all the food-poisoning types, and probably the whole group, produce endotoxins which have the striking property of being highly resistant to heat and capable of withstanding temperatures above 100° C. without loss of toxicity. This unusual quality, and the great rapidity with which they multiply upon meat and other suitable foodstuffs, are two important factors in relation to food infections.

* An excellent account is given by Geiger, Dickson, and Meyer, *Epidemiology of Botulism*, U.S.A. Public Health Bulletin, No. 127, 1922.

Savage and Bruce White have studied the method of action of strains of this group upon the alimentary tract, and have demonstrated the presence of a powerful irritant, both in boiled and in unboiled cultures, which acts rapidly and intensively upon the mucous membrane of the stomach of rabbits, and which was most readily demonstrable in those types within the group which were responsible for outbreaks of food poisoning. In fatal cases of salmonella food poisoning the one characteristic pathological feature is severe gastro-intestinal inflammation.

Clinically it is possible to recognize two distinct types, one being due to the ingestion of the heat-resistant toxins without living bacilli, and the other to the introduction of living salmonella bacilli, with or without a considerable amount of preformed toxin. The outbreaks due to undestroyed toxins without living bacilli are typically met with when canned foods are the vehicle, although in some of these outbreaks the living bacilli may also be present. They are characterized by a short incubation period (usually two to four hours), the brunt of the attack is upon the alimentary tract, and the symptoms produced are often acute in onset and very severe. Fortunately the acute effects pass off quickly with the elimination of the toxic substances (often in twenty-four hours or less), and a fatal result is very rare. While the main effect of the toxin is a gastro-enteric irritation, characterized by severe diarrhoea, vomiting, and abdominal pain, other symptoms, such as a rise in temperature, cramps, and subsequent prostration, suggest some absorption of toxins.

When the incriminated food contains living salmonella bacilli, with no great quantity of toxins, the incubation period is usually longer (twelve hours or more). The symptoms are very similar to the above, but less abrupt and usually less severe in onset, while the constitutional symptoms are more definite. Prostration, continuing long into convalescence, may be a prominent feature, while in severe cases marked collapse may occur, giving rise to considerable anxiety. Long-continued illness is probably associated with penetration of living bacilli and their establishment in the solid internal organs (especially liver and spleen), and a fatal result may ensue. In general the case mortality is surprisingly low and only about one to two per cent, even when living bacilli are ingested.

In spite of prolonged and extensive investigations, both in connection with individual outbreaks and as regards the distribution and sources of these salmonella strains, there are considerable lacunæ in our knowledge as to the paths of infection and as to the exact ways the bacilli gain access to the incriminated food. The evidence is against the view that members of this group are natural inhabitants of the human or animal intestines, so that the possibility or even proof of ordinary excretal contamination explains nothing, since it cannot supply the specific bacilli. There is no evidence that members of the group have a habitat outside the animal body. Infection from a human carrier of the bacilli has been advanced in a good many outbreaks, but for most is a pure assumption, and for only two or three outbreaks has positive proof been forthcoming. Infection from animal sources offers a much stronger case. Salmonella infections in animals are fairly common, and there are numerous outbreaks recorded for which the source of infection has been definitely traced to the consumption of meat or milk from a specifically infected animal. In the majority of outbreaks the facts demonstrate that the food was derived from healthy animals or was not even of animal origin, and this explanation is not valid. The most reasonable hypothesis to explain their causation (space will not permit a full exposition) is infection of the food from specifically infected animals, infection being carried indirectly. This may be by direct handling, infected knives, flies, etc. In this connection both rats

and mice are justifiably suspect, since both species frequently suffer from salmonella infections and may excrete these bacilli for considerable periods after recovery.

TREATMENT.—As regards treatment of individual cases, the primary object is to eliminate the bacteria and toxins. Since vomiting and diarrhoea are nearly universal and generally violent, there is usually no need to assist nature along these lines. The treatment is mainly symptomatic and directed to counteract the prostration and collapse which frequently are marked features. There is no specific treatment at present available for salmonella infections. Treatment of other types of food poisoning (except botulism) is on the same general lines.

INVESTIGATION OF OUTBREAKS TO ASCERTAIN THEIR CAUSE AND TRUE NATURE.

Since these are so often neglected or conducted along faulty lines, it is desirable to deal with the question in some detail. Botulism is separately dealt with under that section, and the following applies to all other types.

Food poisoning is not a notifiable disease, but all outbreaks should be reported to the Medical Officer of Health. He will usually be in a position to make a detailed investigation as to the extent of the outbreak, ascertain the food implicated, and obtain all particulars as to its source and possibilities of specific contamination. Sometimes very detailed inquiries are necessary before the affected food can be established. The family doctor is often in a position to obtain portions of the food as actually supplied to the family, and special efforts should be made to obtain a portion, however small. A careful note should be made of its physical properties when comparatively fresh. The exact incubation periods are important, and should be noted with care.

Laboratory investigation is essential for a full explanation, and, except for the very few cases definitely chemical in nature, it is the bacteriologist and not the chemist whose aid should be invoked. Four classes of material throw light upon the causation, i.e. :—

1. *Any Portions of the Supposed Peccant Food.*—These must be actual portions remaining over (and even scraps may do) from the food supplied which caused the illness. Frequently none is available.

2. *Post-mortem Materials from Fatal Cases.*—The spleen, pieces of liver, pieces of the small intestine, pieces of large intestine, and kidney are the most useful. To make a post-mortem examination and fail to submit the organs to bacteriological examination is for the most part a waste of time. When available this is both the easiest and the most reliable material on which to base a diagnosis as to the cause of infection.

3. *Voided Material from the Cases.*—Specimens of faeces, and sometimes vomit, from the sufferers while in the acute stage may give positive results, but are less useful than the other groups of material.

4. *Samples of Blood for Serological Examination from the Sufferers.*—One great advantage is that there is no urgency about these samples, since any serological reactions persist for many weeks, while in any case they will not develop until a week or more after the onset. The collection of these specimens, therefore, is better left over until the other samples have been sent and their examination started, which will enable the bacteriologist to indicate exactly what he requires. Classes 1, 2, and 3 must be sent without delay, and if possible packed in ice.

BIBLIOGRAPHY.—Anything in the nature of a detailed bibliography is impracticable, as space is not available to quote the reports and papers (well over 600) which bear upon this subject and which have been consulted. Numerous references will be found

in the following: *Food Poisoning and Food Infections*, William G. Savage, 1920, Cambridge University Press; *Investigation of the Salmonella Group, with Special Reference to Food Poisoning*, William G. Savage and P. Bruce White, 1925, Special Report No. 91, Medical Research Council; *Food Poisoning: A Study of 100 Recent Outbreaks*, William G. Savage and P. Bruce White, 1925, Special Report No. 92, Medical Research Council.

FOOD, PRESERVATIVES IN.

Joseph Pricisley, B.A., M.D., D.P.H.

The Public Health (Preservatives, etc., in Food) Regulations, 1925, were issued under date of Aug. 4, 1925, but do not come into force until Jan. 1, 1927, and then only in part, as those Regulations that relate to butter and cream will not be operable until Jan. 1, 1928, whilst the Regulations that prohibit the sale of an article of food containing any preservative which is necessarily introduced by its use in the preparation of preserved bacon, ham, margarine, or butter do not take effect until July 1, 1927 (as regards bacon, ham, and margarine), and July 1, 1928 (as regards butter), respectively.

The Regulations are based on the recommendations of the recent Departmental Committee on the Use of Preservatives and Colouring Matters in Food, and provide for the prohibition of the importation and sale of articles of food to which preservatives and other specified substances have been added.

The provision as to importation (Part III) is to be enforced by the officers of Customs and Excise and by the port and other sanitary authorities responsible for the administration of the Public Health (Imported Food) Regulations, 1925. In connection with this co-ordinated jurisdiction, it has been arranged with the Commissioners of Customs and Excise that, so far as meat and fish and their products are concerned, the enforcement of the Regulations will normally be left to the local authorities and their officers, and that the officers of Customs and Excise will normally enforce the Regulations as far as they apply to other articles of food. In this latter connection, however, local authorities may also take action, but, in order to prevent overlapping of administration, must give notice to the local officer of Customs and Excise that they (the local authorities) propose to take samples of other articles of food (other than meat and fish and their products), or to initiate proceedings in connection with their importation: indeed, in certain circumstances, an officer of the local authority must obtain the consent of the officer of Customs and Excise before taking a sample, e.g., in regard to the examination of a cargo or consignment comprising an article of food in connection with which the duties of an officer of Customs and Excise have not been wholly discharged.

It has, unfortunately, not been found practicable to lay down definite standards in all cases of preservatives and colouring matters that would be, if in excess of such standards, injurious to health, or, at least, deemed to be so in law. The first schedule attached to the Regulations is a useful attempt in this direction, and sets out a list of articles of food which may contain certain preservatives or colouring matters, in each instance, together with the maximum amounts per million parts (estimated by weight) in the case of the preservatives, as shown in the table on page 190.

With regard to colouring matters, the following may not be used at all:—

- | | |
|--|--|
| 1. Metallic colouring matters: Compounds of any of the following metals—
antimony, arsenic, cadmium, chromium, copper, mercury, lead, and zinc. | |
| 2. Vegetable colouring matters: Gamboge. | |
| 3. Coal tar colours: | Number in colour
index of Society
of Dyers and
Colourists, 1924 |
| a. Picric acid (carbazotic acid) | 7 |
| b. Victoria yellow (saffron substitute, dinitrocresol) | 8 |
| c. Manchester yellow (naphthol yellow, Martin's yellow) | 9 |
| d. Aurantia (imperial yellow) | 12 |
| e. Aurins (rosolic acid, yellow coralline) | 724 |

The second schedule to the Regulations sets out particulars as to labelling articles of food containing preservatives (and of the kinds of preservatives which are alone allowed), e.g., sausages, sausage-meat, coffee extract, pickles and sauces, and (where the proportion of benzoic acid exceeds six parts per million) grape-juice and wine.

ARTICLES WHICH MAY CONTAIN PRESERVATIVES OR COLOURING MATTERS.

Food	Preservative	Parts per Million (by weight)
1. Sausages and sausage meat containing raw meat, cereals and condiments	Sulphur dioxide ..	450
2. Fruit and fruit pulp, not dried :		
<i>a.</i> Strawberries and raspberries	" ..	2000
<i>b.</i> Other fruit	" ..	1500
3. Dried fruit :		
<i>a.</i> Apricots, peaches, nectarines, apples, and pears.	" ..	2000
<i>b.</i> Raisins and sultanas	" ..	750
4. Unfermented grape-juice and non-alcoholic wine made from such grape-juice if labelled in accordance with the rules contained in the Second Schedule to these Regulations.	Benzoic acid ..	2000
5. Other non-alcoholic wines, cordials and fruit juices, sweetened or unsweetened. ..	(Either sulphur dioxide or benzoic acid ..	350 600
6. Jam (including fruit jelly prepared in the way in which jam is prepared, but not including marmalade made from citrous fruits).	Sulphur dioxide ..	40
7. Candied peel	" ..	100
8. Sugar (including solid glucos?)	" ..	70
9. Corn syrup (liquid glucose)	" ..	450
10. Gelatin	" ..	1000
11. Beer	" ..	70
12. Cider	" ..	200
13. Alcoholic wines	" ..	450
14. Sweetened mineral waters	(Either sulphur dioxide or benzoic acid ..	70 120
15. Brewed ginger beer	Benzoic acid ..	120
16. Coffee extract	" ..	450
17. Pickles and sauces made from fruit or vegetables.	" ..	250

The above are very important, but, unfortunately, as already stated, are too restricted.

FOX-FORDYCE DISEASE. (*See SKIN, FOX-FORDYCE DISEASE OF.*)**FRACTURES.**

E. W. Hey Groves, M.S., F.R.C.S.

General Problems.—Sir Robert Jones¹ calls attention to this matter in a lecture entitled 'Crippling due to Fractures', and the questions he raises are well worth our careful consideration. His main points are as follows :—

Very many cases of fracture are so treated as to give rise to permanent crippling deformities, and this is often the case in patients of active adult life. Such bad results are certainly preventable, and the question is, 'Why are they not prevented?' In the early days of the war, gunshot fractures had a high mortality, often required amputation, and even if the limb was saved it was so deformed as to be only a crippled member. This was all changed when cases were properly organized. Central control (which Sir Robert is too modest to mention was his own), simplicity of splinting, and, above all,

segregation of cases, team work, and continuity of treatment, served to save the situation and to make fracture treatment one of the best instead of one of the worst features of military surgery.

But now in most of our big teaching hospitals the treatment of fractures is conducted much as it was in the early days of the war. They are relegated to the care of newly qualified residents both in the out-patient department and in the wards. They are regarded rather as a nuisance to be put up in plaster and got rid of as quickly as possible. The method of getting rid of them which is coming more and more into vogue is to send them off to the Poor Law hospitals—institutions which are often excellently built and equipped, but which are not provided with a medical or nursing staff adequate to carry out fracture treatment. All this is deplorable from the point of view of the education of the medical student. He gets no clear and connected idea about the treatment of fractures. He sees a few cases briefly looked at, hurriedly splinted, and quickly evacuated. He sees special cases treated by open operation, but he is left without any idea of how to manage a case himself in his own practice. The following conditions are mentioned as those which often give rise to permanent crippling: fractures of the neck of the femur, treated by a Liston's splint and traction; sagging of the lower third of the shaft of the femur, causing a genu recurvatum; Pott's fracture with eversion of the foot; fractures put up in plaster case and left for many weeks; fractures which, owing to inadequate ambulatory splinting, have given rise to great secondary deformities.

The remedy suggested for this state of affairs is practically the same as that proved by the experiences of the war, viz., segregation and team work. Every large hospital, whether teaching or not, should have its out-patient and in-patient fracture department under the control of one or two of the visiting surgeons and a physiotherapist, with a whole-time resident assistant. One or more sisters should be permanently attached to the department, which should also have an adequate 'follow-up' system by which late results are seen and recorded.

At a recent meeting of the British Medical Association the surgical and orthopaedic sections met in joint conference and discussed these views of Sir Robert Jones. The meeting was well attended by surgeons, both general and orthopaedic, as well as by men in general practice. Although the case against segregation of fractures was most ably presented, yet it was very remarkable what an overwhelming weight of opinion was expressed in favour of Sir Robert's plan. In fact, one came away from the meeting wondering why, if the case for segregation was in itself so strong and was so ably advocated by such men as Sir Robert Jones and Sir Berkeley Moynihan, it was nevertheless not carried out in the great majority of our hospitals. The only definite argument adduced against it is that a special fracture department would tend to take fractures away from the student during his dressership, and that it would not be possible to lengthen the curriculum so as to make obligatory the attendance at another specialty. Clearly this reason is poor in itself and quite insufficient to account for the general opposition to the reform. It cannot be maintained that a large and important group of cases should be treated badly in order that teaching may be good. It may be confidently stated that one month spent in a good fracture clinic will be of more profit in learning about fractures than six months spent in general dressing when fracture experience is limited to seeing cases inadequately treated and untimely evacuated. Or, better still, if one or two days a week for six months are spent in the fracture clinic during the whole period of dressership, a student will get a good idea of the subject and will see many cases well treated from start to finish.

The Chemical Basis of Fracture Repair.—Although many conditions are known in which the size and density of the bones are altered, and although several of these conditions, e.g., rickets, pituitary tumour, and osteomalacia, have a very well-defined chemical pathology, yet we are still ignorant of the factors which control osteogenesis. In the case of rickets, however, though we may not understand the underlying processes, we know enough of them to be able to prevent or cure the disease by chemical and physical means. In rickets there may be a deficiency of calcium and phosphorus or of a vitamin. Exposure to sunlight or ultra-violet rays will augment and to some extent take the place of the latter. Protti,² having proved the rapid action of Strontium Salts in the cure of rickets, has now proceeded to test the same

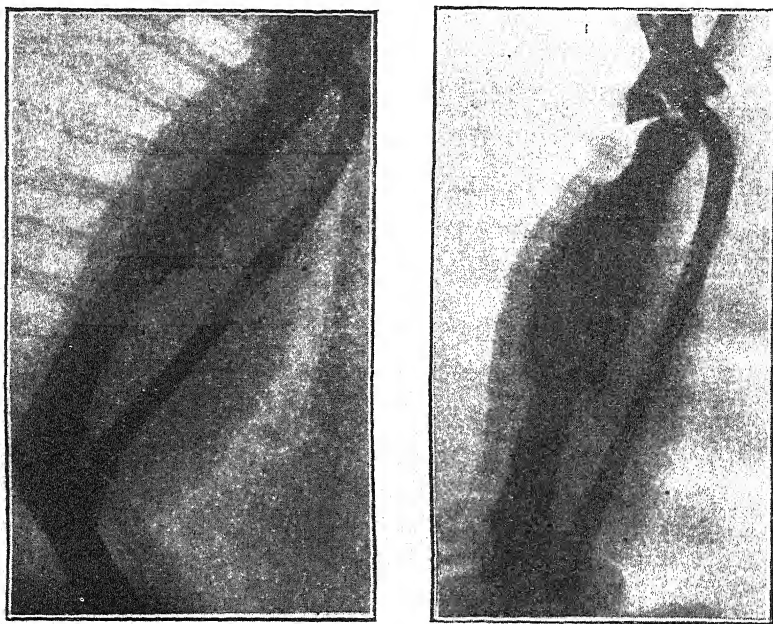


Fig. 21.—The radiogram on the right shows the large amount and good calcification of the callus developed at the level of the fracture of an ulna in an adult chicken which received 4 grm. of strontium lactate daily during the month following the fracture. The left hand figure shows a radiogram of the control.

(By kind permission of Professor Protti and the 'Archivio Italiano di Chirurgia').

agent in the course of simple fractures. He has experimented with fowls, and his pictures certainly show that the birds given milk of strontium develop a much more dense and abundant callus than the control (Fig. 21). It is an interesting observation that both magnesium and strontium have been noted to have powers of osteogenetic stimulation, because both these elements are so closely allied to the calcium of the bone tissues.

Petersen³ has made a careful study of a number of cases of ununited fractures, and from this he deduces most important results. In normal individuals the blood contains about 10 mgrm. of Calcium Salt per 100 c.c. of serum, and similarly about 4 mgrm. of Phosphorus. In 11 out of 17 cases of ununited

fractures which he has observed, the blood showed a deficiency of either the calcium or the phosphorus, and this was noticed in all those cases where non-union persisted in spite of repeated operations. The deficiency of the phosphorus is much more frequent and more marked than that of the calcium. It is stated that no healing ever takes place if the calcium and phosphorus are so reduced that their product is less than 30; also that if and when by suitable diet and drugs this product has been raised to 40, healing always occurs. In all the cases cited, there were so many and such diverse operations adopted that it is very difficult to estimate what share the therapeutic changes had in the result. It is very notable that it is a matter of great difficulty to raise the deficient phosphorus content of the blood.

The Operative Treatment of Fractures.—During the last ten years there has been a general tendency, both here and abroad, to limit the operative treatment of fractures to specially selected cases. In a recent discussion in the French Society of Surgery this attitude was that adopted by the majority of the speakers. Fredet⁴ put in a plea for the retention of Lambotte's *fixateur** as being useful in certain cases; but it is very unlikely that this instrument will ever be used by those who understand the possibilities of pin or caliper traction. Fredet and many of the French surgeons hold that the act of open fixation of the fracture exerts a retardation upon the reparative process. This is probably correct, but it is more likely due to the injury and devascularization of the bone than to the mere influence of metallic bodies. The use of cerclage by metal bands is said to cause slow union, with subsequent rarefaction of callus and secondary deformity. Oblique fractures of the tibia and fractures of both bones of the forearm are the cases most frequently submitted to open operation by French surgeons.

Elbow-joint Fractures in Children.—Fractures about the elbow-joint in children represent a very important type of injury, the treatment of which requires much care and judgement. All authorities are now in practical agreement about the principles which should be followed; but unfortunately these principles are often neglected, with disastrous results. I. E. Siris⁵ has written an excellent account based on a study of 181 cases treated in a good hospital service in New York. But even in such a good service there were 70 cases in which the result was either definitely bad or in which restoration of function was unduly delayed. It may therefore be fairly stated that the problem is a difficult one in practice, though it may be easy in theory. The actual nature of the injury was a supracondylar fracture (including separated epiphysis) in 109, separation of the external and internal condyle and posterior dislocation of the elbow in about 20 cases each. In regard to diagnosis there is a good word of warning. In young children an X-ray may not reveal the full nature of the injury, because the unossified parts of the bone throw no shadow. Again, X-ray pictures may show fissured fractures without displacement, which are not seen by the screen. All cases of severe elbow injuries in children should therefore be treated as fractures until the subsidence of swelling and return of function proves that recovery has taken place. The ultimate result in the great majority of the cases was good; but recovery was delayed or prevented in about 70. In 20 there was a stiff elbow which gradually yielded to treatment; most of these were due to too early forced movement. In 30 cases there was exuberant callus with slow or incomplete recovery; this undesirable complication was usually associated with incomplete reduction, followed often by special attempts to mobilize the elbow by forced movements. There were

* A metal bar outside the limb from which a series of screws pass through the soft parts into the shaft of the bone.

9 cases of nerve injury (musculospiral or ulnar), in all of which recovery took place spontaneously. Myositis ossificans occurred 7 times, and was generally due to too early forced movements. Ischæmic paralysis took place no less than four times; in 3 cases it followed the use of moulded splints applied to the flexed elbow, and in 1 the use of a pad in the bend of the arm.

The present writer would summarize the treatment as follows: The first principle of treatment consists in full reduction under general anaesthesia, carried out as early as possible, i.e., before swelling and tumefaction have occurred. If the advice of a consultant is to be sought and cannot be obtained within a few hours, it is much better for the practitioner to carry out reduction under anaesthesia without delay. Reduction consists in steady forcible traction on the forearm with the elbow extended and the hand supinated, followed by flexion of the elbow with maintenance of the traction, the lower end of the humerus being held backwards whilst the forearm is pulled forwards and the hand brought to the shoulder. If, after this manoeuvre, full flexion can be accomplished without producing great tension at the elbow-joint, this reduction is probably complete. It is very dangerous to force flexion against great resistance at the elbow. If such resistance is encountered, it is due either to incomplete reduction or to swelling of the parts produced by exudation. To force flexion against this resistance is to invite compression of the vessels and to risk the occurrence of ischæmic paralysis. If a repeated attempt at reduction fails to overcome this resistance to flexion, then flexion must only be produced to a point where resistance begins, and then, after X-ray examination, the choice will have to be between increasing the flexion after a few days have allowed subsidence of the swelling, or open operation. The writer is very strongly of opinion that this is a group of cases in which the rôle of open operations is not usually appreciated. The operation required is a very simple one, consisting in an exposure of the joint through a lateral or rarely a posterior incision, followed by manipulating the displaced fragments into correct position. The elbow is fully flexed whilst the parts are still under observation, and so held whilst the wound is being closed. In cases of marked displacement of one of the condyles, the fragment may be held in correct position and then fixed by a fine nail or ivory peg. Open operation on these cases has fallen into disrepute because elaborate plating or wiring operations have been done, and such procedures are generally followed by great callus reaction, and the elbow finally assumes just that obstinate rigidity which it is our chief aim to prevent.

The after-treatment is very important although very simple. The arm is fixed in full flexion of the elbow with supination of the hand, by means of a bandage which ties the wrist to the shoulder or the neck. The whole principle consists in making the forearm bones act as a splint to the lower end of the humerus, and any other splinting is as unnecessary as it is undesirable. The elbow should be left free for inspection and for light stroking massage. The position is maintained for a week or ten days, and no massage should be done unless a masseuse is available who can be trusted not to do more than the 'gentle caress'. After a week or ten days the wrist sling is taken off daily, and the hand is brought down first so far as the child will allow it without pain, and then replaced. At the end of a month the elbow should come down to about 90° to 120°, and an ordinary sling can be substituted for the wrist sling.

Fractures of the Neck of the Femur.—Fracture of the femoral neck still remains a subject which needs earnest attention. Cases of this injury are only too often the victims of bad treatment, and they remain lame for life whilst they might well have been cured. In the first place, in many cases the nature of the injury is overlooked; the patient is simply kept in bed, and it

is not until months after the accident that an X-ray reveals the solution of continuity of the bone, and then so much absorption has taken place that full restoration is impossible. If, however, the nature of the fracture is recognized at an early date, there is absolutely no excuse for bad treatment. It is an injury which can be cured with good restoration of function in the great majority of cases. R. Whitman⁶ has done splendid work in the demonstration of the essential facts which underlie the treatment of the fractures of the femoral neck. The injury is one which may occur in young adults or at any period of life, although it is most common in the aged. The most potent cause of non-union is a want of apposition between the fractured surfaces. The proximal fragment lies embedded in the acetabulum, whilst the distal falls away from it and is drawn up by the muscles. It is only by pulling the leg and then forcibly abducting it that the fractured surfaces can be brought into apposition (*Fig. 22*). The parts should then be retained by a plaster spica

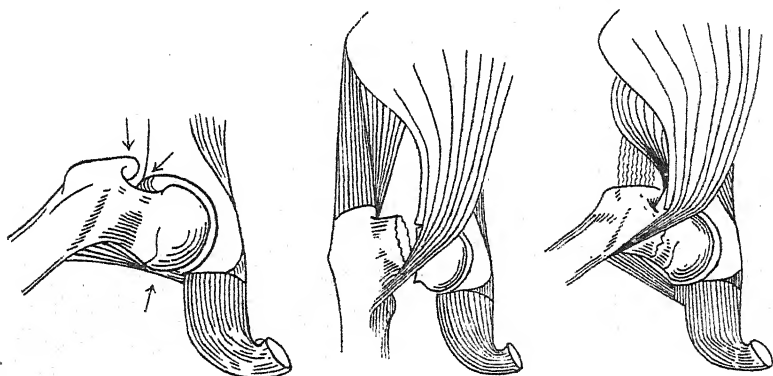


Fig. 22.—Fracture of neck of femur. The evolution of the abduction treatment. Original diagrams illustrating the mechanism of the method applied for complete fracture, 1904.

(Re-drawn from the '*Annals of Surgery*'.)

extending from the chest to the foot. This must be retained for three months, and, after it is taken off, the hip must be protected from weight-bearing for a further period of three months by an ambulatory splint. If the plaster is properly applied, the patient can be turned over, or propped up, every day, and after a few weeks can be got up with crutches.

There can be no doubt as to the soundness of Dr. Whitman's work or as to the excellence of his results; but it is open to two criticisms. Abduction of the thigh will certainly press the distal part of the femoral neck against the proximal; but it is not clear how it can influence the position of the latter in those instances where the head of the femur is rotated so that the fractured surface looks forwards or backwards. Much more perfect apposition of the fractured surfaces can be made by means of an open operation, and then fixation by a bone peg will do away with the necessity of prolonged plaster. The point of fundamental importance is that the fractured surfaces of the broken bone must be brought into exact and intimate contact and so fixed at an early date after the injury.

In Germany much attention has been given to the elucidation of the nature of the non-union which usually follows subcapital fracture of the femoral neck. Microscopical examination of the head of the bone in these conditions usually shows extensive necrosis, the bone-cells all being dead. It has therefore been

assumed too hastily that such necrosis with resulting non-union is a necessary result of the fracture, and it has become a common practice to treat the condition by excision of the head of the bone. But fortunately further researches have shown this practice to be based upon an error. In two independent papers R. Bonn⁷ and F. Hesse⁸ have shown that total necrosis of the femoral head is by no means the necessary result of subcapital fracture. If only a portion of the reflected fibres of the capsule remain intact, then the bone is capable of vitality and of bony union. (See also FEMUR, FRACTURES OF.)

REFERENCES.—¹*Brit. Med. Jour.* 1925, i, 909; ²*Archiv. Italiano di Chir.* xii, 275; ³*Jour. Bone and Joint Surg.* 1924, Oct., 885; ⁴*Bull. et Mém. Soc. nat. de Chir.* 1925, Jan. 17, 6; ⁵*Surg. Gynecol. and Obst.* 1925, May, 665; ⁶*Ann. of Surg.* 1925, Jan., 374; ⁷*Arch. f. klin. Chir.* 1925, Feb. 28, 270; ⁸*Ibid.* Jan. 26, 142.

GALL-BLADDER DISEASE, INVESTIGATION OF. *John H. Anderson, M.D.* *Edmund J. Spriggs, M.D., F.R.C.P.*

INTRODUCTORY.

The importance of gall-bladder disease is well shown by an investigation of J. M. Blackford and M. F. Dwyer¹. In 1650 cases, the approximate relative frequency of abdominal organic disease causing dyspepsia was found to be: gastric ulcer, 1; gastric carcinoma, 2; reflex appendicitis, 4; duodenal ulcer, 6; gall-bladder disease, 12. This notwithstanding, much is still in doubt as to the function of the gall-bladder in health and its changes in disease.

Functions of the Gall-bladder.—F. C. Mann² concludes that the gall-bladder; (a) Concentrates bile; (b) Discharges bile into the duodenum intermittently, especially during digestion, though never emptying completely; (c) Undergoes spontaneous contractions of unknown functional significance; (d) Secretes mucus (a specific secretion is possible but not proved). The liver secretes bile continuously but at a variable rate, least when fasting. In animals a block of the common duct produces jaundice much more quickly if the gall-bladder is also removed (3 hours against 36), due probably to loss of concentration in the gall-bladder.

Removal of the gall-bladder does not noticeably affect general nutrition or metabolism. Following removal, however, the entire extrahepatic biliary tract becomes dilated to as much as six times its pre-operative size. This dilatation depends on the sphincter of the common duct remaining intact.³ In dogs, after cholecystectomy, the flow of bile into the duodenum is at first continuous, but later becomes intermittent as in the normal animal; this appears to be made possible, or at least assisted, by the dilatation above mentioned.

After reviewing other theories (reservoir, absorption, secretory, bile-flow regulation, and pressure regulation), Mann suggests that the function of the gall-bladder is to concentrate the bile salts, which on reaching the intestine during digestion are reabsorbed and stimulate the liver. "The function of the gall-bladder is to stimulate the liver to increased activity at the time the gastro-intestinal tract is most active." Working with dogs,³ he shows that, after a specific cholecystitis (produced by intravenous administration of Dakin's solution), the time of appearance of bilirubin in blood and urine depends on the degree of involvement of the gall-bladder, and concludes that its power of concentrating bile is impaired or may be totally lost in an inflammatory process. Bernstein⁴ considers that the function of the gall-bladder and its contents is to maintain intestinal motility.

Causation of Gall-stones.—There is still doubt as to the influence of cholesterolemia in the formation of gall-stones. Sir Berkeley Moynihan⁵ gives "two chief factors, infection, and increase in the cholesterol content of the blood." He regards hypercholesterolemia (i.e., above 0.19 per cent) as of

importance in diagnosis, stating that 75 per cent of patients in whom it was found were suffering from cholelithiasis. [In a series of cases at Ruthin Castle, hypercholesterolaemia has not been consistently found in those regarded clinically as examples of disease of the gall-bladder.—J. H. A.]

J. M. H. Campbell⁷ and W. Bain⁸ review carefully the literature. The former concludes, from his own 52 cases, that "there is no evidence that the formation of gall-stones is caused by a raised cholesterol content of the blood and bile", whilst the latter lays stress on biliary stasis as a contributory factor. F. A. Knott and E. W. Bowell³⁵ consider biliary concentration and stagnation necessary for typical gall-stone formation. The importance of infection is generally allowed, though Professor Rovsing⁶ denies it and considers gall-stones arise in the liver by a precipitation of black pigment caused by a transient local intoxication. The infecting organism is regarded by Venables and Knott¹⁵ as coliform, and by Rosenow³⁶ as streptococcal.

[It is suggested by the present reviewer that the gastric subacidity so often seen in gall-bladder disease is a potent causative factor. The diminution of hydrochloric acid acts in two ways—(a) it allows infective organisms to enter the duodenum, as shown by Hurst and his co-workers; (b) it predisposes to biliary stasis by reduction in the acid chyme, which normally stimulates emptying of the gall-bladder. The two resultant conditions, infection and stasis, form a suitable combination for disease.—J. H. A.]

NON-SURGICAL BILIARY DRAINAGE.

Discussion and Method.—Sodium and magnesium sulphate, or waters containing them, have long been recommended and used with benefit in diseases of the gall-bladder; they were given mainly for their cathartic action, also with the object of flushing the biliary passages generally. The routine use of magnesium sulphate in particular has been found good in patients regarded as having a distended gall-bladder.

In 1917, Meltzer¹¹ announced that a solution of magnesium sulphate brought in contact with the duodenal mucosa of animals produced a profuse flow of bile; two years later, Lyon¹² showed that this also occurred in man (the solution being introduced through an Einhorn's tube). Lyon described three types of bile, which varied in appearance, consistence, and amount, and came, in his opinion, from different sources. He named these 'A' bile, from the common duct, 'B' bile, from the gall-bladder, and 'C' bile, from the liver itself. This use of magnesium sulphate is known variously as the Meltzer-Lyon or non-surgical method of biliary drainage. Meltzer postulated a contrary innervation for the gall-bladder and opening of the common duct (sphincter of Oddi), so that there is a concurrent contraction of the gall-bladder and relaxation of the sphincter. Mann² also thinks this possible, but could not prove it.

All the early experimental work was done on animals or anaesthetized humans, and as such was open to objection. Diamond¹³ showed that, in dogs with duodenal fistula, carmine previously placed in the gall-bladder was only found in microscopic quantities in the duodenum, after the latter had been repeatedly injected with magnesium sulphate. I. Matsuo¹⁴ quotes Hara and Shibata, who found typhoid bacilli in large quantities in the human duodenum after the use of magnesium sulphate, though previously these had been absent or in minute numbers. He also had ocular proof, for in a human abdomen opened under local anaesthesia he saw the gall-bladder contract to one-fourth of its previous size when magnesium sulphate was introduced through a duodenal tube. (Haemmerli, quoted by J. F. Venables and F. A. Knott,¹⁵ concurs.) Matsuo then dilated the gall-bladder by direct injection of a dye

(azorubin S). "During this procedure the bile had no trace of any red colour." When magnesium sulphate was again used, "it was observed that the gall-bladder contracted very clearly, and that almost all the dye solution was evacuated in a short time." This experiment was repeated later with like results. D. N. Silverman and L. J. Menville,¹⁶ in two cases where the gall-bladder had been rendered opaque to X rays by intravenous injection of sodium tetrabromphenolphthalein, found that a reduction in size and shape of the gall-bladder followed the use of magnesium sulphate, and that without it there was no parallel diminution. Venables and Knott¹⁵ and Y. Tada and K. Nakashima,¹⁷ working with the duodenal tube, confirm the action of magnesium sulphate.

Notwithstanding Diamond's work,¹³ it appears established, therefore, that magnesium sulphate in the human duodenum does cause a flow of bile from the gall-bladder. That other substances act in the same way is also correct, as L. R. Whitaker, G. Milliken, and E. C. Vogt¹⁸ have seen the gall-bladder, as shown by cholecystography, diminish during digestion; the stimulus to contraction in that case probably being the acid chyme. The exact mechanism of this emptying is not clear. It may be due to the crossed innervation postulated by Meltzer. Chester Jones¹⁹ suggests a relaxation of the duodenal wall in which the muscle fibres of Oddi's sphincter take part.

Lyon's subdivision of bile into 'A', 'B', and 'C' would appear to depend on the colour sense of the individual observer and his technique. Matsuo¹⁴ supports him, but Venables and Knott,¹⁵ though they agree on the action of magnesium sulphate, doubt the existence of three types of bile. Owing to the possibility of mixing in the duodenum it appears to be an unnecessary and unreliable refinement. The fact that bile resembling in appearance 'B' or 'gall-bladder bile' has been found after removal of the gall-bladder is probably due to accompanying liver disturbance.¹⁹

The magnesium sulphate is generally given through a duodenal tube. Chester Jones¹⁹ gives 60 c.c. of a 33 per cent solution, and Venables and Knott¹⁵ 10 c.c. of a 25 per cent solution; other workers use various quantities between these limits. The single dose is mostly advised, but Chiray, Le Clere, and Milochivitch,²¹ following Lyon, give 75, 45, and 30 c.c. of a 33 per cent solution at fifteen to thirty minutes' interval. Venables and Knott¹⁵ wash out the stomach before passing the tube into the duodenum, and, after drawing off a specimen of duodenal contents, wash out again with sterile water before introducing the magnesium sulphate solution. Other observers do not take such great precautions against contamination. H. W. Soper²⁰ shows, however, that oral administration is efficacious. Venables and Knott¹⁵ agree, but state that the effect is slower—fifteen to twenty minutes as against one to two minutes. Soper advises a dose of one-half to two ounces of a saturated solution, flavoured with tinct. card. co., by the mouth. The bile is withdrawn in all cases by the duodenal tube, the position of which is verified by X rays, though Venables and Knott say that the presence in the aspirating syringe of a fine froth, generally bile-stained, with a neutral or alkaline reaction to litmus, is proof of the tube being in the duodenum. Chester Jones¹⁹ advises X-ray verification in all cases, and is generally supported.

Diagnostic Use.—After centrifuging, Chester Jones¹⁹ found an increase of total bile pigments, urobilin and urobilinogen, in cases associated with (a) increased blood destruction, and (b) liver disturbance. In group (a) are pernicious anaemia, hæmolytic jaundice, malaria, hæmolytic streptococcal septicæmia, Banti's disease, paroxysmal hæmoglobinuria, polycythæmia, and lead poisoning. Group (b) included infectious or catarrhal jaundice, some cirrhoses, cancer of the liver, many cases of chronic cholecystitis and stone, and chronic passive congestion.

Venables and Knott¹⁵ consider that normal duodenal contents are cell-free (i.e., less than five per field under $\frac{1}{2}$ -in. objective) and sterile. In presence of leucocytes, cholesterol crystals, and coliform bacilli (except in achlorhydria) one is "almost justified in diagnosing gall-bladder disease", i.e., stone or cholecystitis.

M. Einhorn²² insists on examining fresh specimens, and says pathological bile is turbid, varies in colour, and that large cholesterol crystals one above another suggest stone. He describes "black sandlike patches" as "always signs of a pathological condition of the gall-bladder", and shows an excellent series of drawings of microscopic findings.

C. W. McClure and E. Vance⁹ established figures for the cholesterol content in duodenal bile by examining a number of normal subjects, 85 per cent of whom showed a cholesterol content over 0.23 per cent. Thirteen out of fifteen patients with chronic cholecystitis (including cases of stone) showed a cholesterol content between zero and 0.16 per cent. Two others (one with stone) showed 0.78 per cent and 0.57 per cent. A low cholesterol concentration was also obtained in cases of catarrhal jaundice, cirrhosis of the liver (one syphilitic), Hodgkin's disease, and cancerous occlusion of the common duct.

G. M. Piersol and H. L. Bockus¹⁰ quote Judd's statement that in 1290 cases of gall-bladder and bile-duct disease, 26.8 per cent had associated pancreatitis. Using the Meltzer-Lyon method of drainage in 40 cases of cholecystitis, they found 34 had a reduction of over 50 per cent in one or more pancreatic enzyme.

Remedial Use.—As a remedial measure non-surgical biliary drainage is advised in chronic cholecystitis without stone,²¹ catarrhal jaundice,^{19, 20, 21} chronic retention of bile in gall-bladder,²¹ Weil's disease,²⁰ after cholecystectomy,²¹ and for temporary relief in acute and chronic cholecystitis.⁹ Lyon²³ gives an account of treated cases and the indications for surgical interference. Aaron²⁴ considers the method of more use in diagnosis than treatment, and Armitage²⁵ is dubious of its use in either.

Summary.—(1) Magnesium sulphate can be used to expel the contents of the gall-bladder. (2) Such contents are of diagnostic importance. (3) Magnesium sulphate is a remedial measure in certain phases of gall-bladder disease, especially where surgery is contra-indicated or postponed. Literature is given by Matsuo,¹⁴ Chester Jones.¹⁹

CHOLECYSTOGRAPHY.

In 1909, Abel and Rowntree,²⁶ when investigating the pharmacological properties of certain substances, discovered that phenoltetrachlorophthalein was excreted in the bile after intravenous injection, and suggested the use of this dye as an indicator of liver function. The success of the method is discussed elsewhere (see LIVER EFFICIENCY TESTS), but a modification of it has proved of value in studying the function of the closely allied gall-bladder, which in the natural state is frequently invisible to X rays.

In February, 1924, E. A. Graham and W. H. Cole²⁷ announced that the calcium salt of tetrabromphenolphthalein is excreted into the gall-bladder, and has a sufficiently high atomic weight to make it opaque to X rays. Later the sodium salt was found more workable, and in May, 1924, Graham, Cole and Copher²⁸ published a series of cases in which they claimed considerable success for the new method. Cohen and Roberts supported them and described the first series in England.²⁹

The technique of the test as now used is as follows: 3.5 to 5 gram. of the salt, according to the weight of the patient, are dissolved in 35 to 40 c.c. of sterile distilled water, filtered, and then sterilized in a boiling-water bath for fifteen minutes. This solution is stable for thirty-six hours in the dark, and

can be prepared over-night. At 8.30 a.m., 20 c.c. are injected into a vein, and the remainder at 9 a.m., the patient fasting. A few c.c. of sterile saline solution are run into the vein before and after the dye, as leakage produces local induration or necrosis. The patient lies on his right side, if in bed, though he may be up and about. Forty grains of bicarbonate of soda are given every three hours while awake, to aid gastric and duodenal rest. No lunch is given, and the evening meal is mainly carbohydrate. The next day ordinary food is taken. Starvation minimizes the emptying of the gall-bladder and so permits concentration of the dye.

X-ray photographs are taken at 4, 8, 12, 24, and 36 hours after injection, simplified by Carman and Counsellor³⁰ to 5, 8, and 24 hours. The patient lies on his face, right arm extended above head, left arm parallel with side, head turned to the left. A Potter-Bucky diaphragm and 30 ma. radiator Coolidge tube are used, 30 ma. of current, and 5-in. spark gap. The exposure is made in the right costovertebral angle, at 20 in. target film distance, and varies from three to seven seconds according to the thickness of the patient. The breath is held during the exposure in the usual way.³¹

The normal shadow of the gall-bladder is oval in shape, smooth in outline, and begins to appear at 3 hours. It is small at first, reaches its maximum at 6 to 12 hours, begins to fade at 24 hours, and is gone at 32 to 36 hours. After food there is a quick reduction in size, and this is regarded as a diagnostic sign of a healthy gall-bladder.³¹ *Plates XVIII, XIX* show a healthy gall-bladder filling and emptying. The patient was operated on later for removal of the appendix, and a healthy gall-bladder was present.

Abnormal manifestations are: failure to fill (*Plate XX*), scanty or delayed filling, delay in emptying, unvarying size of shadow, extremes of size, deformity of contour, mottling or central defects. In the absence of cirrhosis or gross hepatic defect, interference with filling suggests obstruction (stone in cystic duct, obliteration following severe cholecystitis); delay in emptying is caused by biliary stasis; unvarying size of shadow by loss of elasticity of the walls of the gall-bladder; mottling or central defects by stone or papilloma. Adhesions cause deformity of contour, but duodenal dilatation or excessive gas in the colon may lead to error. Some observers suggest a turpentine enema or the passage of a rectal tube as likely to obviate this.^{30,31} Sosman¹⁸ has noticed that a shadow which has faded at 24 to 36 hours may reappear at 72 hours. This is probably due to dye being reabsorbed from the alimentary canal and again excreted in the bile.

This method has been well tried, and 90 to 95 per cent of accurate results are claimed. Carman and Counsellor³⁰ point out that grave liver disease, such as cirrhosis, may prevent filling. The dye is toxic, and may cause a general or local reaction. The general reaction varies from transient nausea to rigor and vomiting. For this reason its use is inadvisable in common-duct blocking, owing to the severe reaction due to defective excretion.³⁰ Loss of colour, fall of blood-pressure, cyanosis, and depression have occurred. "The symptoms result from lowered blood-pressure following splanchnic dilatation and passive congestion of liver, pancreas, spleen, and stomach. A dose of 10 drops of 1-1000 adrenalin is advised."³⁰ [In seven cases at Ruthin Castle, vomiting occurred in two and transient nausea in one]. No fatal case has been recorded, and the dose given is well within the limits of safety as ascertained by the lethal dose in rabbits. [We have heard of one case of fatal syncope during the intravenous administration of this drug.—Ed. M.A.] Carman and Counsellor³⁰ consider the method unsuitable in any type of cardiovascular disease. The local reaction occurs only when dye leaks into the tissues at the site of injection, and varies from induration to necrosis. Hot fomentations give most relief.

PLATE XVIII.

CHOLECYSTOGRAPHY



Male, age 26. Oral administration of iodeikon: 12 hours after ingestion, prone position. Gall-bladder filling normally. Gall-bladder normal at operation for removal of appendix.

PLATE XIX.

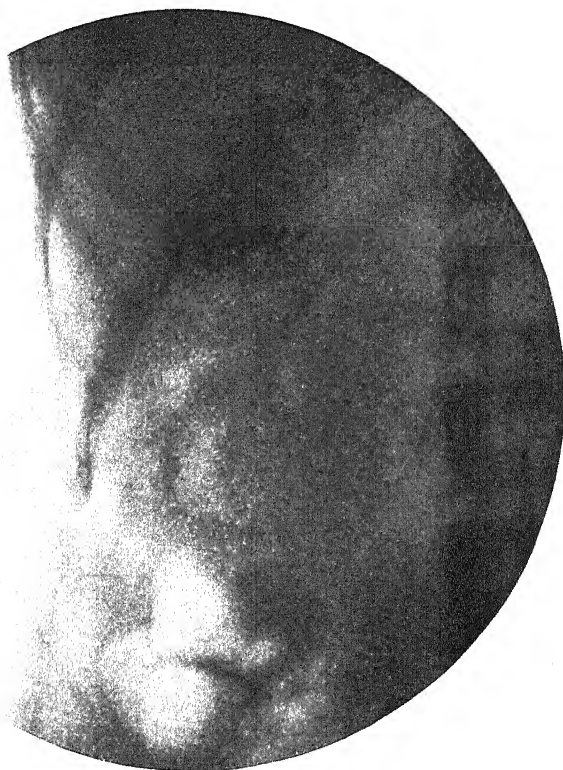
CHOLECYSTOGRAPHY—*continued*



Same patient as *Plate XVIII* 20 hours after ingestion, prone position. Gall-bladder emptying normally; shrinkage started soon after food at 15 hours.

PLATE XX.

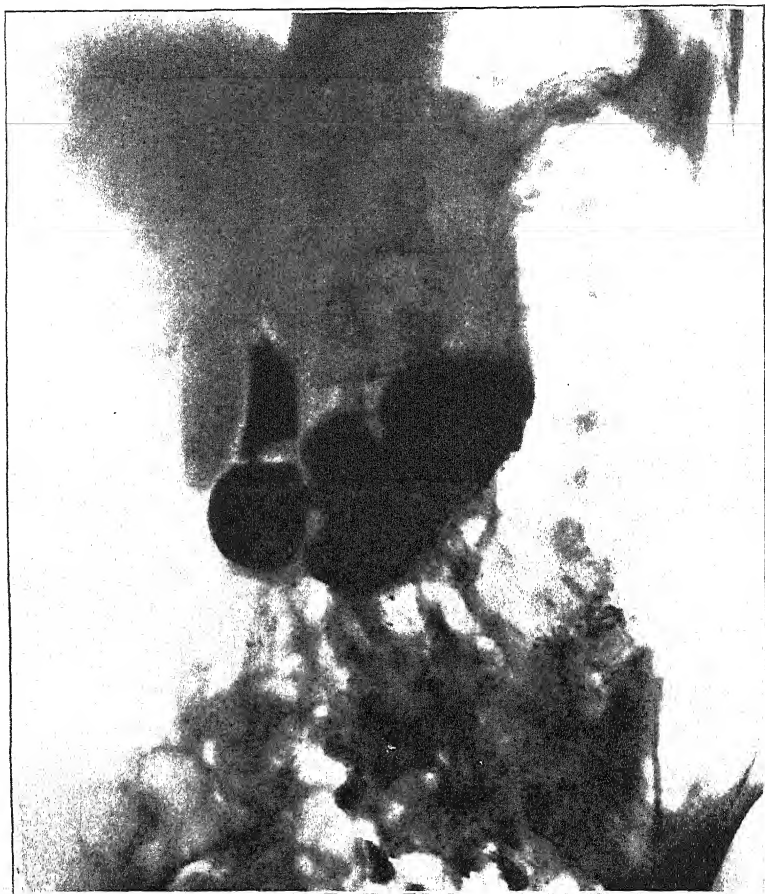
CHOLECYSTOGRAPHY—*continued*



Female, age 39. Oral administration of iodelkon: 12 hours after ingestion; shows poor filling, irregular shape; gall-stones visible. No operation to date.

PLATE XXI.

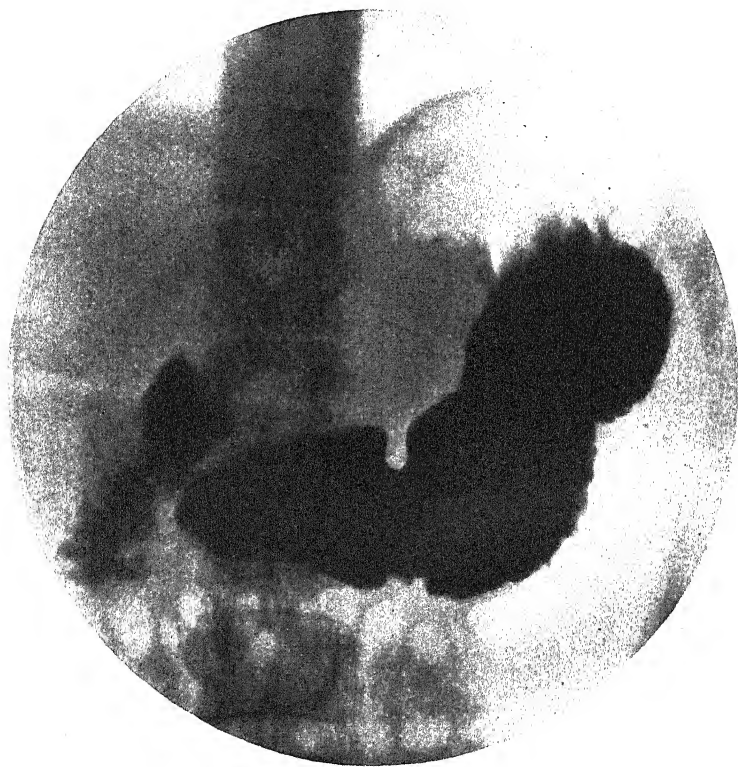
CHOLECYSTOGRAPHY—*continued*



Female, age 26. Oral administration of Iodeikon: 13½ hours after ingestion and immediately barium meal, erect position. Gall-bladder elongated, compresses duodenal cap and displaces vertebral spine. At operation strong adhesion between body of gall-bladder and second part of duodenum.

PLATE XXII.

CHOLECYSTOGRAPHY—*continued*



Same patient as *Plate XXI*, 4 hours after ingestion of iodeikon and $\frac{1}{2}$ hour after barium meal, prone position. Shows pressure effect of gall-bladder on duodenal cap. When viewed laterally, second part of duodenum was drawn forward.

PLATE XXIII

CHOLECYSTOGRAPHY—continued



Same patient as *Pictures XXI and XXII*, 16 hours after ingestion of iotekon and $2\frac{1}{2}$ hours after barium meal; patient lying on left side with screen in front. Air filled second part of duodenum held up by adhesions to gall-bladder.

In January, 1925, Whitaker and Milliken³² pointed out that the opacity of the iodine radicle was twice that of the bromine radicle owing to the greater atomic weight, and also that the percentage of halogen salt present by weight was 61 to 50 in favour of the iodine compound. In dogs the toxicity was the same, but as a smaller dose would produce an equal effect, the general reaction was much less, as this depends directly on the amount of the dye injected. The salt now most used is sodium tetraiodophenolphthalein or *iodeikon*. The dose advised is 0.04 to 0.045 grm. per kilo. of body weight, made to a 10 per cent solution with freshly distilled water, to which is added 1.5 to 2 c.c. of 10 per cent sodium carbonate, and autoclaved at 15 lb. for 30 minutes. This is given intravenously in one injection by gravity at low pressure, with saline before and after.³² Graham, Cole and Copher³³ use a similar dose made up to a 12.5 per cent solution by dissolving each gramme of solid dye in 8 c.c. of sterile distilled water, and given in two doses by syringe. Advantages of *iodeikon* are: smaller dose, less general reaction, local reaction limited to induration, only one puncture required. The accuracy of the results is the same with both salts. Rectal and subcutaneous injections gave shadows in rabbits, but are not advised.³⁴

Whitaker, Milliken and Vogt¹³ have obtained good results with *oral administration*. Given as a powder by the mouth a dose twice as large as for intravenous work is required, and there is an iodoform taste, slight nausea, possible vomiting, and a loose bowel movement some four hours later. They attributed the vomiting to the direct action of the dye on the mucous membrane of the stomach, and to avoid this gave it in pill form coated with salol or stearic acid. [If vomiting was entirely due to such direct action, the presence of dye in the vomit would be expected. In one case the vomit was radiographed and gave a shadow equal in density to that given by an equal bulk of tap-water, thus showing absence of dye. The vomiting is therefore not entirely due to local action on the gastric mucous membrane.—J. H. A.] 3.5 to 6.5 grm. is made up into 20 pills so as to get 0.08 grm. per kilo. The patient has a light supper of bread and tea or coffee or cocoa and milk at 8 or 9 p.m., and takes four pills each quarter of an hour. As far as possible the patient sleeps on his right side, and an X-ray photo is taken 12 and 15 hours after the last pill was taken. A meal is then given, followed in one hour by another X-ray to see the influence of digestion on emptying the gall-bladder. In 44 people thus examined, 27 had no symptoms, 5 vomited, 5 had mild diarrhoea, and 7 slight nausea.

[At Ruthin Castle, not more than 3.5 grm. of *iodeikon* are given in 6 salol-coated pills at 8.30 p.m., after a supper of bread and butter and cocoa, the ordinary evening meal having been omitted. The patient sleeps on the right side, 40 gr. of bicarbonate of soda being given four-hourly if awake. Photographs are taken at 12 and 15 hours with the patient fasting, and at 16 and 24 hours when ordinary diet has been resumed. If the gall-bladder is not empty at 24 hours, another photograph is taken at 36 hours. "Exposures are made with the patient erect, prone, supine, and lying on the left side with the screen in front (*Plates XXI, XXII*, XXIII*). This last position may show the duodenum drawn across to the gall-bladder by an adhesion, though it is possible that a duodenum dilated by gas may produce a similar appearance. Observations are now being made to determine the mobility of the full gall-bladder in its fossa" (O. A. Marxer, personal communication). By this method useful results have been obtained. In ten cases, three vomited—mainly undigested food and bile—and two had loose precipitate motions. The

* In *Plate XXII* for "4 hours" read "14 hours."

constitutional disturbance was less than with intravenous administrations, and the shadows obtained were quite as good. The dose may still err on the high side, for there were good shadows in two cases where pills were seen intact in the colon.—J. H. A.]

The oral method, therefore, is more convenient and has less troublesome sequelæ than the intravenous, but the latter is more under control, is said to produce better shadows, and is perhaps more dependable: it has not yet been fully tested, but in 93 per cent of supposed normal cases, normal shadows were obtained.¹⁸ Its originators claim that, if there is no shadow, cholecystic disease is almost certainly present, and suggest that it be used as a preliminary method of investigation, to be followed by the intravenous method if any doubt remains. [In the two series of personally known cases referred to above, the oral method proved as reliable as the intravenous from the standpoint of diagnosis; as it is more comfortable for the patient, it is now the method in use for routine work at Ruthin Castle.—J. H. A.]

Conclusion.—Cholecystography has a logical basis, gives good results, and is a valuable adjunct in the diagnosis of diseases of gall-bladder and adjacent organs. The oral method possesses definite advantages, and appears sufficient for all ordinary purposes, [Results obtained by the oral method are shown in *Plates XVIII-XXIII*, reproduced from photographs taken by O. A. Marxer, to whom I am deeply indebted.—J. H. A.] (See also X-RAY DIAGNOSIS.)

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GALL-BLADDER, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

D. F. Jones, L. S. McKittrick, and D. L. Sisco¹ report the results of gall-bladder operations in diabetics. According to Joslin and other authorities, it is becoming increasingly evident that gall-bladder disease bears a distinct relationship to the essential pathology of diabetes. Many cases probably owe the degenerative changes in the islands of Langerhans to infection derived from the biliary tracts. Therefore, in diabetics, the treatment of such disease is even more urgent than in normal individuals.

The preparation of the patient is important. For several days before operation a diet liberal in carbohydrates (75 to 100 gm.) is indicated; fats should be restricted to 50 gm. or less in order to prevent acidosis from incomplete oxidation. A glycosuria resulting from this diet is of no significance. We do not fear the leakage of a little sugar. The danger is from acidosis. Diacetic acid in the urine is a good index of the operability of any given case. A few days of such a liberal sugar diet with restricted fats and liberal doses of insulin will nearly always render the patient temporarily free from acid products of incomplete fat metabolism. The operation must be conservative.

As much as possible is done under local anaesthesia, and during the deeper stages light gas and oxygen or ether is added. Drainage only is indicated in many cases. Cholecystectomy should not be undertaken unless it is clear beforehand that it can be done easily and expeditiously, without too much trauma to the liver and surrounding tissues. Good surgical judgement will enable one to decide just how far one may go in attempts at radical cure.

The after-care is very important. Just as soon as the nausea is over, the patient is fed large amounts of fluid and considerable sugar. In case of prolonged vomiting, rectal or subpectoral administration is indicated. The urine is very carefully watched. Every three or four hours tests for sugar are made, and, as soon as it appears, insulin is given in considerable doses. The object is to promote the oxidation of the sugars even at the expense of a temporary glycosuria. By this means the great danger, acidosis, can be warded off during the critical stages, so that within a week or ten days the patient can be safely returned to a regular diabetic régime. In a number of cases removal of such sources of trouble has resulted in a real permanent improvement of the diabetic condition, amply warranting the operative risk.

Dubose² reports the experience in 20 cases of the operation of anastomosing the gall-bladder with the alimentary tract. *Cholecystgastrostomy* is the operation of choice, but supposing this is rendered impossible by adhesions or other conditions, *cholecystduodenostomy* may be done. This operation has a wide field of usefulness. Many cases come to us with benign obstructions of the common bile-duct which would be very difficult to clear. Most of these are poor surgical risks. Anastomosis of the gall-bladder to the stomach is by far the simplest solution of the problem. It is an easy operation, and completely cures the condition. In malignant obstructions, death ensues rapidly when external drainage of bile is instituted. The deprivation of the body of all the products elaborated by the liver proves fatal in a few weeks. Anastomosis will save these patients for many months. It also has a distinct field in the treatment of gastric conditions. The lowering of the acidity of the stomach by the bile may be slight theoretically, but practically it will bring about a cure of the symptoms of ulcer or pylorospasm due to hyperacidity. In cases with jaundice, one is distinctly limited to the amount of surgery one dares to do. Most such cases have to go through two operations. Drainage of the bile through a cholecystostomy is a preliminary step to prepare the patient for the more radical removal of the obstruction. Such a slight operation as an anastomosis can be well borne even by a very toxic patient, and often permits us to bring about a cure in one operation instead of two. In acute pancreatitis we face the problem of combating an infection which is almost certainly biliary in origin. Removal of the gall-bladder would seem to be the logical procedure. However, it presents two very serious drawbacks. First, it is a big operation on a very sick patient. Second, we make it exceedingly difficult to establish drainage at any other later date in case of recurrence. Anastomosis of the gall-bladder with the stomach has neither of these objections. Immediate drainage is established, and we still have the gall-bladder, if subsequent drainage is needed.

The technique of these operations is exceedingly simple. A small rubber tube is fastened into the invaginated gall-bladder with a purse-string. This is inserted into a very small hole in the stomach, and the whole surrounded by a single layer of serosal sutures. Reinforcement with the great omentum is advocated.

E. S. Judd and V. G. Burden³ report the rather frequent occurrence of *internal biliary fistula*; 153 cases are summarized. Stones are the etiological factor in nearly every case, and the fistulae result from perforation of these

calculi through the walls of the gall-bladder. The duodenum is the favourite site for the formation of these fistulæ, making up about three-quarters of them. Most of the rest lead to the colon, a few only being gastric. It has often been assumed that the formation of such a new drainage for the gall-bladder was curative. Experience contradicts this old dictum. All these patients presented very severe clinical symptoms. The history was generally of very long duration. Colics were frequent and severe. Fever, pain, evidences of sepsis, jaundice, and all the classical signs of biliary disease were present to a marked degree. Pancreatitis was common in the series. At operation the fistulæ were generally small. The gall-bladders often still contained stones, and were invariably severely infected, often to the stage of suppuration. Closure of the fistula with cholecystectomy is the operation of choice. Only two of these cases were diagnosed before operation.

Muscatello⁴ says that operations in the early stages of gall-tract disease are practically free from risk. Surgery should be resorted to as soon as the diagnosis is made. The late complications—jaundice, severe sepsis, universal adhesions—are sure to come on, and when they do the cure is rendered difficult and often impossible. Hepatitis may ensue. Pancreatitis, either the chronic fibrosing form or that leading to diabetes, is caused often by bile-tract disease. Acute attacks of pancreatitis can be prevented by early gall-bladder surgery. This view is acquiring more and more supporters, and the more we learn of gall-tract pathology the more inclined we are to do operations which are to a certain extent prophylactic.

A. Gosset,⁵ in a paper on *common-duct surgery*, says that he has entirely abandoned the Kehr incision in favour of the transverse. Splitting the right rectus has many disadvantages. Several nerve-fibres must be sacrificed, and hernia is likely to follow on account of lack of innervation to the portion of the rectus lying between the incision and the mid-line. Retraction of the edges is often very difficult, and exposure of the deeper biliary tracts is generally poor. The transverse incision offers much better exposure. It extends from the margin of the ribs to a point in the middle line a little above the umbilicus. It can be made a little higher or lower, depending where the edge of the liver can be palpated. The edges can easily be retracted widely, and spasm of the abdominal muscles does not interfere to such an extent; in fact, it may help. With the head of the table slightly elevated and a sand-bag under the back, the liver can usually be pulled out of the wound. In some of the cases, if more room is needed, a middle-line incision is easily added, making a right-angled flap. After the abdomen is open, the first step should be to mobilize the liver as much as possible, and then to free the duodenum from its adhesions to the bile-tracts, so that it can be retracted downward out of the way. This gives a complete exposure of the common duct, permitting its opening and catheterization. In the 118 cases that are reported, the death-rate was 5 per cent in the afebrile ones and 15 per cent in the septic cases. It is generally possible to tide the patient over a septic period so that the operation can be done 'à froid'.

A. O. Wilensky and M. A. Rothschild⁶ believe that the *relation of cholesterolin metabolism to gall-stone production* is of great importance. On the basis of long series of studies of the blood-cholesterin content in biliary diseases, they assert that many cases of gall-stones are due simply to an excess of cholesterolin in the body. The importance of infection or obstructive factors is not minimized, but they bring convincing evidence that the possibility of a cholesterolin diathesis has not been accorded the importance it deserves. In their studies it was noted that in those cases in which operation brought about a lasting cure the blood-cholesterin dropped to normal figures and stayed

there. Other cases are cited where operation alone did not lower this hypercholesterinæmia, and diet was resorted to with complete success. The most interesting part of the series is that portion in which operation was followed by recurrences of stone. After ruling out the cases in which infection persisted, stones were overlooked, etc., it is shown that about two-thirds of the recurrences were due to the fact that the lipid metabolism remained abnormal and favoured the deposition of calculi in the gall-bladder or ducts.

It is clear, therefore, that following gall-bladder operations we should examine the patient's blood for cholesterol. If the figures remain unduly high, a low lipid diet should be prescribed. This is rather difficult at times, on account of the extreme restriction necessary; but in most cases a marked lowering of the blood-cholesterin can be achieved by simply lessening the lipid intake without attempting to exclude them entirely. Elimination of fats, butter, eggs, nuts, oils, and milk products will generally suffice.

A. Leitch⁷ has shown that the presence of stone in the gall-bladder may be the cause of carcinoma of that organ. This has been suspected from the frequent association of stone and cancer. Clinically, stones have been found in from 70 per cent to 100 per cent in different published series. Leitch inserted stones into the gall-bladders of guinea-pigs, and at the end of one year found malignant changes in many cases. In view of the fact that carcinoma of the gall-bladder in rodents is excessively rare, this is a very important contribution to our knowledge.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1924, Oct. 16, 709; ²*Surg. Gynecol. and Obst.* 1924, Sept., 295; ³*Ann. of Surg.* 1925, Jan., 305; ⁴*Riforma Med.* 1923, xxxix, 1072; ⁵*Presse méd.* 1925, April 18, 497; ⁶*Amer. Jour. Med. Sci.* 1924, July, 66; ⁷*Brit. Med. Jour.* 1924, ii, 451.

GASTRIC AND DUODENAL ULCER. (See also STOMACH, SURGERY OF.)

Robert Hutchison, M.D., F.R.C.P.

PATHOGENESIS.—It is now generally agreed that chronic ulcers of the stomach and duodenum arise out of acute ulcers which have failed to heal. The presence of free HCl seems to be one of the factors which favour the ulcer becoming chronic. It is also generally agreed that acute ulcers are of infective origin and produced by the action of streptococci or their toxins acting on part of the mucous membrane so as to produce an area of necrosis which by a process of autodigestion leads to the ulcer. The streptococci may be derived from any source of infection in the body, and Rosenow has shown that they have an 'elective' action—organisms from (for example) the teeth or tonsils of patients suffering from gastric ulcer produce gastric lesions when injected into animals in a high proportion of cases, whilst organisms from the teeth or tonsils of patients with (say) cholecystitis produce in animals lesions of the gall-bladder, and so on. The infection takes place through the blood-stream. R. L. Haden,¹ in a study of 12 cases of peptic ulcer from the standpoint of a possible causal relation of dental infection, has confirmed these results, and concludes that dental infection is an important factor in the causation of gastric and duodenal ulcer. He goes so far as to say that dental infection cannot be ruled out even by X-ray examination of the teeth; pulpless teeth that appear sound on such examination harbour infection, in his experience, almost as often as those that give a positive result in the radiograph.

W. H. Ogilvie,² whilst admitting that ulcers are the result of bacterial action, looks at the whole question of infection of the alimentary canal in a wider way. His experiments have convinced him that living streptococci can pass through the stomach and enter the intestine in most individuals under exceptional circumstances, and in others at all times. He has shown that these may be absorbed, chiefly at the aggregations of lymphoid tissue and by means of the

wandering cells. The majority are at once destroyed, but sometimes they reach the circulation via the lymph channels and are carried to the mucous surface of the alimentary tract, where they produce lesions (ulcers, cholecystitis, appendicitis, etc.). He is of opinion that we have to consider the general question of alimentary infection, and not fix our attention too much on local foci. Even the teeth, he says, which are so often condemned and executed after scant trial because of their unfortunately accessible position, may, in many instances of alimentary infections, be the victims and not the criminals. Infection is conveyed by the blood-stream, and he does not regard infection from one point of the alimentary canal to another via the lymphatics as being yet proved.

B. B. Crohn² and his co-workers have studied what they call 'the life-cycle of peptic ulcer', particularly in relation to such questions as: Do ulcers ever spontaneously heal? Does an ulcer heal temporarily and partially when the patient enters a period of freedom from symptoms and the niche disappears? How often is such a healing process a durable and lasting one, and what are the pathological stages in such a restitution to integrity? What are the conditions incident to the recurrence of ulcer? And, finally, to what extent do the usual surgical procedures vouchsafe lasting prevention of recurrence of the original or of new ulcers? The material of their study was 70 specimens obtained at operation and correlated with the clinical histories and X-ray reports of the cases. Their conclusions are as follows:—

1. Chronic peptic ulcers may form within two or three weeks of the onset of symptoms. This conclusion is based on the history of the patient, the observation of the recurrence of a niche within two weeks of recurrence of the symptoms, and, finally, on the ease with which such short-timed ulcers can be made to disappear under medical treatment (from ten days to two weeks).

2. Chronic ulcers achieve their maximum size within a few weeks, and do not thereafter extend their borders.

3. Pathological and röntgenographic evidence indicate that healing in the intermission stage does progress. The degree of healing and its permanency depends on various factors. The younger the individual and the shorter the history, the greater the tendency to healing. Cases with long intermission periods and with mild attacks heal more readily than those with continuous active symptoms. Ulcer in a person over 45 can heal only with difficulty.

4. Histological evidence indicates that healing takes place by the filling of the crater of the ulcer with firm granulation tissue, by retraction of the muscularis, by contracture of the opening, and by regeneration of the mucous membrane. We have no pathological specimen of gastric ulcer in which complete healing has taken place. We have several specimens indicating the healing of duodenal ulcers in the intermission stage.

5. Cases of duodenal ulceration in which there has been hæmorrhage seem to heal most readily.

6. Neither pathological evidence of healing nor röntgenographic demonstration of the disappearance of the niche is to be considered as proof of clinical cure. Ulcers may readily heal in the intermission stage, but unfortunately show a tendency to break down again, probably at the same site. Certain ulcers eventually heal completely; others do not, and these become surgical cases.

REFERENCES.—¹*Arch. of Internal Med.* 1925, April, 457; ²*Brit. Jour. Surg.* 1925, April, 752; ³*Arch. of Internal Med.* 1925, April, 405.

GASTRIC AND INTESTINAL FUNCTIONS. *Robert Hutchison, M.D., F.R.C.P.*

The most important publication on this subject during last year was Dr. J. A. Ryle's Goulstonian Lectures on gastric function in health and disease.¹ Although there is little in them that has not been published before, they give

an excellent summary of the present state of our knowledge (and ignorance) of gastric function. It is impossible to epitomize the lectures here, but the attention of readers is directed to them.

It is interesting to note, on the authority of Dr. Franklin White,² that there is a decline in the popularity of the fractional test-meal in America. This will not surprise readers of this ANNUAL, where it has always been maintained that the fractional method is needlessly troublesome and time-consuming. In order to get over the objection to the Ewald meal that it does not always show HCl in the low acid cases in which the secretion is delayed, White passes the Rehfuess tube at the end of an hour; if there is plenty of acid, he draws off all the contents and calls the test finished. If the secretion is low, the tube may be left in till the end of digestion, fractions being withdrawn at intervals. This seems a useful compromise between the two methods.

J. M. H. Campbell and J. J. Conybeare³ have made observations on healthy subjects to compare the results given by the test meal (fractional) and by the X rays. They found that, as regards rate of emptying, the results given by the two methods do not always agree. The following are amongst their principal conclusions: (1) In health, high acidity of the gastric juice is most commonly associated with a high hypertonic stomach which empties rapidly after a barium meal. It is found most frequently in men playing games regularly, and in no subject in this series who was classed as 'below the average'. This group of findings is associated to some extent with a relatively short broad chest. (2) On the other hand, low acidity of the gastric juice is generally but less constantly associated with a low hypotonic stomach, which empties slowly after a barium meal. It is found most frequently in men who were classed as 'below the average', and in no subject in this series who was playing games regularly. This group of findings is associated to some extent with a relatively long narrow chest. Among the exceptions is a subject with achlorhydria, whose stomach, as is usual in such cases, emptied rapidly after the gruel meal and the barium meal, and was normal in position. (3) The conclusions about the rate of emptying are conflicting and require confirmation. Like all other observers, they have found that rapid emptying after the gruel meal and hypochlorhydria are closely associated. The X-ray findings are different, and in each case slow emptying was found in a relatively long, narrow chest, generally with a low hypotonic stomach. It may be that with a heavy barium meal the mechanical factors such as the tone and position of the stomach are of primary importance, and that with the ordinary gruel meal other factors, such as peristalsis, and especially the degree of relaxation of the pyloric sphincter, predominate.

W. C. Alvarez and B. L. Freedlander⁴ have studied the rate of progress of food residues through the bowel by administering to healthy subjects very small glass beads of different colours which are afterwards recovered from the stools. They summarize the results of their investigation as follows: The commonly accepted view that food residues from any one meal are evacuated in the next twenty-four or forty-eight hours is shown to be largely erroneous. It is seen now that the usual large amount of barium given with a small meal acts like agar or liquid petrolatum and speeds up the progress of material through the bowel. In the study here reported, fifty small glass beads were used as an index to the rate of progress of the everyday food of the individual. Ordinarily, some 15 per cent of these beads are passed on the first day; 40 per cent on the second; 15 per cent on the third; and 10 per cent on the fourth day. After that, it may take days or weeks before the last few beads are recovered. The rate of progress varies widely in normal persons. No symptoms of disease were found in men and women who took a week or more to pass 70 per cent

of the beads. Fast rates, i.e., 85 per cent in twenty-four hours, are associated with the passage of soft, badly digested stools.

McClure, Montague, and Campbell⁵ have made some interesting observations on the mechanism of external pancreatic secretion in normal persons, using the duodenal tube. Their conclusions are: (1) That the duodenum is normally alkaline or nearly so after the ingestion of food. This negatives a most essential premise of the 'secretin' theory. (2) That the products of food digestion are the essential factor in causing the stimulation of the secretion of pancreatic juice rather than the formation of 'secretin'. (3) That acidity does not govern the action of the pyloric sphincter.

REFERENCES.—¹*Lancet*, 1925, i, 583; ²*Jour. Amer. Med. Assoc.* 1924, July 26, 260; ³*Guy's Hosp. Rep.* 1924, July, 354; ⁴*Jour. Amer. Med. Assoc.* 1924, Aug. 23, 576; ⁵*Boston Med. and Surg. Jour.* 1925, March 19, 527.

GENERAL PARALYSIS. (See DEMENTIA PARALYTICA.)

GENITAL PROLAPSE. (See PROLAPSE, GENITAL.)

GERMAN MEASLES. (See RUBELLA.)

GLANDULAR FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—R. Gilbert and M. B. Coleman¹ record an epidemic of considerably over a hundred cases which occurred during the late winter of 1923 and early spring of 1924 in the eastern part of Wayne County and adjacent part of New York State. The first cases were very mild, and were believed to be common colds. More serious cases followed, and were at first regarded as mumps or influenza, the correct diagnosis being finally made by the district health officer. C. C. Guthrie and J. F. Pesel² describe an epidemic which occurred in a preparatory school for boys from the latter part of September to the third week in November, 1922. During the course of nine weeks, out of 500 boys from 13 to 18 years of age there were over 300 cases, whereas among 60 masters, nurses, and physician only one contracted the disease.

PATHOLOGY.—In the series reported by Gilbert and Coleman,¹ *Streptococcus hæmolyticus* was isolated from the pus of an axillary gland and from 4 out of 7 throat cultures. Streptococci producing methæmoglobin were present in all except one of the 7 throat cultures. Blood examinations were made in 30 cases: 7, or 23.3 per cent, showed polymorphonuclears, an increase of eosinophils was noted in 66 per cent, and 22, or 73.3 per cent, had an increase of lymphocytes. These observations thus agreed with those of Longcope in the United States and of Tidy and Daniel in England. (See MEDICAL ANNUAL, 1924, p. 189.)

DIAGNOSIS.—Guthrie and Pesel² state that the only disease from which they found it difficult to diagnose glandular fever was dengue, owing to the following characters common to both diseases: (1) A short prodromal period; (2) A sudden onset with chilly sensations; (3) A short, sharp febrile course; (4) Headache, lassitude, and general malaise; (5) Frequent enlargement of the spleen; (6) Enlargement of lymphatic glands and persistence of the enlargement; (7) Cessation of the epidemic with the onset of cold weather and disappearance of mosquitoes; (8) Favourable outcome.

REFERENCES.—¹*Amer. Jour. Hygiene*, 1925, v, 35; ²*Amer. Jour. Dis. Child.* 1925, xxix, 492.

GLAUCOMA.

Lt.-Col. A. E. J. Lister, I.M.S. (Retd.)

The Use of Adrenalin in Glaucoma.—A large number of articles dealing with this subject are to be found in recent literature. In 1923, Fromaget stated he had adopted a new method of treatment in some cases of acute glaucoma.

He used a retrobulbar injection of one or two c.c. of a 2 to 4 per cent solution of novocain, to which were added 2 drops of adrenalin solution. In 1923, Hamburger, who had been working independently of Fromaget, published the results of using an undiluted solution of adrenalin, injected subconjunctivally, in amounts up to $\frac{1}{2}$ c.c., close to the cornea on the temporal side. The intra-ocular pressure decreases, he says, with normal as well as glaucomatous eyes. The intra-ocular tension of the other eye also decreases. Cases in which eserine had not acted, showed a reaction to eserine after these injections. He pointed out that wide dilatation of the pupil followed the injection, and in one case, an acute attack of glaucoma occurred on the same day. The attack, however, yielded to treatment with eserine in half an hour.

Kadlicky¹ says that after the use of adrenalin a lowering of intra-ocular tension occurs which lasts till the second day. From then it rises, to stay at a certain height. In the other eye a similar but lesser and slower change takes place. He concludes that the action depends on a hypertony of the sympathetic. Failure in glaucoma depends on the fact that the blood-vessels cannot react in the sense of a dilatation. The practical value of adrenalin is in cases in which myotics have failed and operation is not possible. The author believes that operation is the correct treatment, but the *action of adrenalin in producing a lowered tension temporarily is a help to the operator.*

A. J. Samojloff² says: (1) That adrenalin produces a decided lowering of intra-ocular tension in normal human eyes. (2) Glaucomatous eyes in the early stages behave as normal eyes; in absolute glaucoma the characteristic lowering of tension does not occur. (3) In glaucoma, adrenalin does not cause any diminution of the characteristics of the curved scotoma, and has no influence at all on the peripheral field of vision. (4) His observations on the glaucomatous scotoma confirm the opinion that adrenalin cannot replace myotics in the treatment of glaucoma. Adrenalin, however, doubtless affords a new means of influencing the intra-ocular tension of the glaucomatous eye, although its action is confined to one side of the glaucomatous process. Two points in this article are of special interest to practitioners who may possibly care to try this method in conjunction with myotics to reduce tension temporarily, until further help can be obtained. (1) The simple method of instilling a tablet containing $\frac{1}{1000}$ grm. of adrenalin produced results very similar to those obtained by injections under the conjunctiva and subcutaneous injections in the temporal region; (2) No bad effects were seen, except that, very rarely, old people with marked arteriosclerosis complained after two or three minutes of palpitations. As the author merely mentions these, they do not appear to have been of much consequence.

H. S. Gradle³ gives a good account of the use of adrenalin in glaucoma which should be read by those thinking of trying this treatment. He describes a case of acute glaucoma with a tension of 70 mm. Hg [normal is about 25—A. E. J. L.] in which all congestive symptoms disappeared and a fall of tension occurred in twenty-four hours, after a subconjunctival injection of adrenalin. In a case of congestive glaucoma, operated on previously by iridectomy, with a recurrence of tension, not relieved by myotics, 4 min. of a 1-1000 solution of adrenalin reduced the tension from 45 to 15 mm. Hg. It rose again, but the injection was repeated, and 1 per cent pilocarpine nitrate solution was ordered. The tension remained normal. Two similar cases have convinced him of the value of adrenalin in a technically good but clinically unsuccessful operation for glaucoma. The author also has found adrenalin most useful in cases of secondary glaucoma (or hypertension due to uveitis). In this condition, however, it may be necessary to repeat the injection. He says: "The subconjunctival injection of adrenalin makes life considerably

easier for the ophthalmologist, for the majority of cases of hypertension of this type yield to the injection".

Hamburger⁴ showed curves from two patients demonstrating the beneficial action of adrenalin. Twenty injections were given in the case of a patient 50 years old, and seventeen in a patient of 80. *Eserine failed to act before the injection*; the use of eserine now kept up the effect of adrenalin for weeks or months. Adrenalin is of special use in chronic glaucoma. It may be used as a powder or an ointment applied to the conjunctiva. Injections, however, are specially active. The danger of producing an acute attack is very slight if one remembers to give adrenalin only where myotics have no effect. As a preventive, the author always gives eserine two hours before an injection. The remedy sometimes fails to be effective. The effect of adrenalin is to produce a passing vasoconstriction followed by a hyperdilatation. In the discussion which followed, Hamburger received a good deal of support, but one speaker (Stock) reported 3 cases of acute glaucoma in 9 cases treated. [Presumably he had not taken the precaution of first instilling eserine.—A. E. J. L.]

The foregoing abstracts, selected from a large number of articles on the subject, give the main facts of this new departure in the treatment of glaucoma. Although opinion in the literature as to its value is not unanimous, the balance seems in favour of its use in certain cases. Personal inquiry from leading authorities indicate that it has not yet been fully tried in England or America. A perusal of the abstracts will indicate the cases in which it has been found of value. The evidence quoted here as to its value is corroborated in other articles too numerous to permit of abstraction.

Acute Glaucoma Operated on Fourteen Years previously by Iridectomy: Excellent After-result.—Rollet and Colrat⁵ report the after-result of a case of acute glaucoma operated on on the tenth day of an acute attack. After the lapse of fourteen years, the vision was $\frac{1}{2}$ and the tension normal.

The Practical Value of Trephining in Glaucoma by Elliot's Method.—V. P. Filatow,⁶ in a careful study of over one hundred cases of glaucoma treated by trephining, comes to the conclusion that the operation is one of the best methods of treating glaucoma. It is superior to iridectomy, but *cannot be regarded as a radical cure*. [It is well to know the results in different countries of operative procedures about which practitioners are liable to be asked. There is a wide difference of opinion as to the best operation in glaucoma. If an operator chooses to trephine, he will find ample support in the literature. The reviewer's experience of trephining has been favourable.—A. E. J. L.]

D. A. Suozew⁷ records a case in which late infection (after two and a half months) followed a trephining by Elliot's method. It led to panophthalmitis, meningitis, and death. The author says that late infections are rare after these operations, but a fatal result in his experience, and as far as he can ascertain in the experience of others, is unique.

High Myopia and Glaucoma.—M. Meyerhof⁸ says a combination of high myopia and glaucoma is very frequent in Egypt. Within a year, in 173 cases of primary glaucoma, 21 cases had a combination of myopia and glaucoma. In later years, glaucoma affects high myopes more frequently than hypermetropes. The onset is always insidious. Only deterioration of vision is complained of. The changes due to myopia make diagnosis difficult even for an expert. Some success was obtained by the use of myotics, but most cases required operation. Iridectomy, trephining, and cyclodialysis were all tried. The author's experience has impressed him in favour of iridectomy.

Axenfeldt⁹ points out that the combination of glaucoma and high myopia is by no means rare and is often overlooked. His further experience would appear to have led him to the conclusion that trephining is the operation of

election, as he has seen a serious case of acute glaucoma follow cyclodialysis, which he formerly advocated. [It is very important to remember that glaucoma may occur in high myopia. The fact that glaucoma usually occurs in hypermetropia has been so stressed, that in some people's minds an idea may have arisen that myopic eyes, especially those with a high degree of myopia, are not liable to develop glaucoma. It is well, therefore, to be reminded of this, as gradual failures of visual acuity, due usually to degenerative changes in the fundus, often occur in high myopia.—A. E. J. L.]

On Colour Rings: How to Distinguish them from the Haloes of Glaucoma.—One winter evening, a medical man, an acquaintance of the reviewer, had homatropine put into his eyes for the purpose of examination of his refraction. On the way home he noticed that, on looking at the street lamps, coloured rings were seen round them. In other words, he could see a halo such as a glaucoma patient sees. He thought at the time it might be due to a temporary disturbance produced by the homatropine, and, having no other ocular symptoms, thought no more about it for some time. Later, however, he noticed that if the night was sufficiently dark and time was allowed for the pupil to dilate, a definite halo could be seen with each eye. On testing him by the method described below, it was at once proved that the haloes were lenticular in origin. The test is a simple one, and may be useful to practitioners who are in doubt as to the significance of a halo in an eye case.

Priestley Smith¹⁰ says that Drualt¹¹ in 1898 showed that certain colour rings depend on the fibres of the lens and are frequently physiological. They are often discoverable if carefully looked for, but seldom noticed otherwise. Those requiring fuller details should read a paper by H. H. Emsley and E. F. Fincham.¹² Briefly, the fibres of the lens under certain normal and abnormal conditions, especially when the pupil is large, diffract light. The obstacles which produce this diffraction are bundles of straight parallel lens fibres distributed in all directions like the spokes of a wheel. When a light is looked at in the dark, the innumerable spectra thus produced combine to form a colour ring around the central light. In such a case, let a screen pass slowly before the eye, its edge being vertical. So long as at least one-half of the pupil remains uncovered, the entering light will fall on fibre-bundles running in all directions, and the colour ring will remain entire; but when more than half is covered, the light will strike no vertical fibres and will no longer be diffracted horizontally; the sides of the ring will therefore begin to disappear. When little of the pupil remains free, the light that still enters will fall only on fibres that are nearly horizontal, and will be diffracted only in directions nearly vertical; hence only small portions of the ring above and below will remain. In other words, *the ring disappears in segments*. The way in which a glaucoma ring is produced may be imitated by means of a glass plate strewn with lycopodium spores. Each particle, by reason of its form, diffracts in all directions; the spectrum due to a single particle is too feeble to be visible, but the joint effect is a brilliant spectral ring. A ring thus produced behaves differently when screened; *it fades gradually as the screen covers more and more of the pupil; it does not disappear in segments*; so long as it is visible, it is entire, for any light still entering the pupil meets with obstacles that diffract it in other directions. This is what happens when the glaucoma ring is tested with a screen. [The practitioner, by using the above test, can say at once that a *colour ring which disappears in segments is not a glaucoma-ring*. The test is extremely simple, requires no special apparatus, and is worth remembering.—A. E. J. L.]

REFERENCES.—¹Arch. d'Ophtal. 1924, 705; ²Klin. Monats. f. Augenh. 1925, 652; ³Amer. Jour. Ophthalmol. 1924, 851; ⁴Trans. German Ophthal. Soc. Heidelberg, Klin. Monats. f. Augenh. 1924, May-June; ⁵Ann. d'Oculist, 1925, March, 212; ⁶Russ. Ophth.

Jour. 1925, iv, 3 (abstr. *Klin. Monats. f. Augenh.* 1925, March, 568); ⁷*Klin. Monats. f. Augenh.* 1925, 739; ⁸*Bull. Soc. d'Ophtal. d' Egypte*, 1924, 35; ⁹*Zentralb. f. d. g. Ophtal.* 1924, July (abstr. *Brit. Jour. Ophthalmol.* 1925, 312); ¹⁰*Brit. Jour. Ophthalmol.* 1924, April, 145; ¹¹*Arch. d'Ophtal.* xviii, 312; ¹²*Trans. Optic. Soc.* xxiii, No. 4, 225.

GONORRHŒA.

Col. L. W. Harrison, D.S.O.

The relation of gonorrhœa to puerperal sepsis was touched upon in a discussion held by the British Congress of Obstetrics and Gynaecology.¹ Dr. T. H. C. Stevenson had shown a remarkable peak of puerperal mortality in the latter part of 1919 which occurred nine months after a peak of similar shape showing numbers of soldiers demobilized after the war. It might be thought that the high puerperal mortality at this time was due to secondary infection conveyed by husbands who had previously suffered from gonorrhœa. Harrison suggested that it was more probable that the men infected their wives with gonorrhœa, and that this was succeeded in the female patients by secondary organisms which would not have gained a footing if the ground had not been prepared for them by the gonococcus. He pointed out how often it happens in males that, following on the gonococcal infection, the urethra becomes infected with those organisms which can be found in health about the entrance to the urethra, but do not cause urethritis until the gonococcus has prepared the ground for them.

The duration of infectivity of gonorrhœa in the male is discussed by J. F. Hogan,² who relates three cases in which gonococci were found more than three years after infection, and one in which positive cultures were obtained eight years after infection. In the first case there had apparently been no further gonococcal infection since three years previously, and no exposure for several weeks prior to the onset of an epididymitis which followed a slight trauma. Cultures of secretion from the prostate and vesicles grew gonococci. The case in which gonococci were found after eight years had apparently normal prostate and vesicles, but smears of the secretion showed gonococci. The author relates cases in which the diagnosis could not have been made but for cultures of the secretions. He insists that cultures are necessary in all cases before the patient is passed as cured, and that these should be repeated some weeks after all treatment has been discontinued.

A simple method for the detection of gonorrhœa in the female is described by Danin,³ who employs a finger-stall to which two strips of litmus paper, one red, the other blue, have been affixed. The stall is drawn on the index finger with the litmus on the flexor surface. The finger thus armed is introduced into the vagina so as to come into close contact with the wall. On withdrawal, the reaction of the secretion is noted. If this is found to be definitely acid, gonococcal infection can be excluded with reasonable certainty. A weakly acid, neutral, or alkaline reaction indicates a search for gonococci. [The method is mentioned, as it was brought to the notice of the reviewer with strong commendation of its value. Unfortunately a trial of the test in the St. Thomas's Hospital V.D. clinic, following carefully the author's directions, did not bear out the claims made for it.—L. W. H.]

Studying gonococcal cuti-reactions, R. D. Herrold⁴ found that a filtrate of a broth culture of gonococci, when diluted to 1-100 and injected intracutaneously, gave rise to reactions in persons who had never suffered from a gonococcal infection. Those suffering from gonococcal infection of more than three weeks' duration mostly gave no reaction. After recovery, however, especially a year or more later, the reaction was again obtained.

TREATMENT.—Silver Nitrate is believed by H. Haxthausen⁵ to be the best of all the silver compounds for the treatment of gonorrhœa, and he supports his case with experiments, both laboratory and clinical, which go far to show

that silver nitrate was relegated to comparative obscurity in favour of the more expensive organic compounds on grounds which were unsound. The old objection to it was that it is rendered inactive by precipitation as silver chloride and albuminates; hence the introduction of the organic compounds, which are stated not to be precipitated. The author studied the penetration of the different silver compounds by the method of Pezzoli, in which the solution of the compound under investigation is poured on the top of a column of gelatin which has been sown with *B. coli*. He modified the Pezzoli method by adding to the gelatin some ascitic fluid, so as to make it in its chemical constitution more closely like tissue. After this the depth of the zone in which *B. coli* did not grow could be measured easily. The results were interesting, and showed that the finding of other workers that silver nitrate does not penetrate so deeply as the other organic compounds is true only for a certain strength of silver nitrate. Testing the weaker concentrations of silver nitrate (1-500 and weaker), such as would be used now in the treatment of male gonorrhœa, the author found that there is an optimum strength with which the greatest penetration is secured in the ascitic-gelatin medium. Thus silver nitrate of a strength of 1-10,000 penetrated deeper than stronger solutions up to 1-50, and weaker down to 1-25,000. As the strength of the silver nitrate is increased beyond 1-50 the penetration increases again. By other experiments the author concludes that it is on the formation of silver chloride, the very substance which previous workers believed inert, that the bactericidal effect depends. Further, that it is the physical state in which the silver chloride is precipitated which determines its depth of penetration. The conclusion from this, assuming that the same conditions apply clinically, is that it is wrong in principle, when employing weak solutions of silver nitrate, steadily to increase the strength. On the contrary, the optimum must be found, and maintained throughout the treatment. The author's results afford a reason for the poor results obtained in the laboratory by previous workers, since he found that the strength employed by these (approximately 1-1000) was about the worst from the point of view of penetrative effect. When compared under fair conditions with such organic compounds as protargol, albugin, choleval, argentamin, and argyrol, the silver nitrate solution proved the most penetrating. Further, the author shows that the effect of protargol and other organic compounds depends also on the formation of silver chloride.

Before these experiments were undertaken, the author had commenced some clinical investigations, under very stringent conditions, as to test of cure, and his clinical results supported his laboratory in showing silver nitrate to give the most rapid cures. He suggests that workers in this field of medicine should study the clinical effect of silver nitrate in the light of his laboratory results, endeavouring to discover the optimum strength for the human tissues, and retaining this. [The reviewer has carried out some clinical trials of silver nitrate solution on the lines suggested by Haxthausen, and the results indicate that his work is worthy of serious attention.—L. W. H.]

A new urinary antiseptic which is atoxic, non-irritating, and has a high bactericidal power has been introduced by Veader Leonard⁶ in the form of **Hexyl-Resorecinol**, a waxy substance which is administered, dissolved in olive oil, in capsules. The five qualifications for the ideal urinary antiseptic laid down by Davis, White, and colleagues, of the Johns Hopkins Hospital, are that it should: (1) Be chemically stable; (2) Be non-toxic; (3) Be non-irritating to the urinary tract; (4) Exert an antiseptic action in high dilution in urine of any reaction; (5) Be eliminated in high percentage by the kidney. The author would modify the fifth of these to read: (5) Be eliminated in the urine in sufficient concentration to exert a local antiseptic action, and at

a rate by which *continuous* action may be obtained. He adds a sixth, as follows: (6) Be administrable by the mouth.

Leonard, starting from the work of Treat B. Johnson on the allyl resorcinols, and that of Leo Rettger, who found that the phenol coefficient of the series increased rapidly as it ascended, put these compounds to a number of biological tests. He found that, as the bactericidal power increased, the toxicity dropped, until at hexyl-resorcinol he arrived at a compound which has a phenol coefficient of 46 (or 150 times that of resorcinol) and can be administered to rabbits in doses of 1 grm. per kilo. without apparent toxic effect. Hexyl-resorcinol acts in urine which is either acid or alkaline. As an example of the bactericidal power it can give to urine, a rabbit of approximately 2 kilo. weight received 0.3 grm. Fifty minutes later it voided urine which ran over faecal matter at the bottom of the cage. The urine was picked up from the table with blotting-paper and squeezed into a beaker. In spite of the gross contamination which it had thus received, the urine not only remained sterile, but killed the test quantity of added organisms. Administered to five normal men, it was found that doses of 0.25 to 0.5 grm. hexyl-resorcinol three times a day usually resulted in their urine becoming bactericidal for *B. coli* and *S. albus*; but two of the subjects appeared to require larger doses than 0.33 grm. to produce completely bactericidal urine. In fact, not only do individuals vary in regard to the doses necessary to produce a bactericidal urine, but the same individuals vary from week to week. The secretion of bactericidal urine rose sharply from the first to the third hour after the dose, and was highest at the six- to eight-hour interval, while at fifteen to twenty hours as many as 45 per cent of the specimens were still bactericidal. An important finding was that, if sodium bicarbonate was administered at any time whilst the subjects were taking hexyl-resorcinol, the bactericidal power of the urine fell off very rapidly. When applied to the treatment of urinary infections in a small series of cases, it was found generally that those due to *S. albus*, *S. aureus*, and anhaemolytic streptococci cleared up promptly and there was no recurrence in several months. As to *B. coli* infections of the renal pelvis and urinary tract, the author thinks that, if these are heavy, hexyl-resorcinol alone is not sufficient; some local treatment to reduce the number of organisms is also necessary. The remedy is of no value in infections of the renal parenchyma, but in this respect it does not differ from other urinary antiseptics. The author discusses the reasons for the variations in results, one of which is that the bulk of each dose is excreted as a conjugate which is probably inert. [The reviewer has tested hexyl-resorcinol in a number of cases, and found it preferable to hexamethylene in gonococcal, streptococcal, and staphylococcal infections of the lower urinary tract. Its non-irritating quality is a particular advantage in acute gonorrhoea, in which hexamine often causes strangury and even haemorrhage. In *B. coli* affections he has found the new antiseptic disappointing.—L. W. H.]

Bismuth has been tried as a local application to the urethra by F. Landt,⁷ who found that a mixture of equal parts bismuth subnitrate with dermatol made to a 1 per cent emulsion with water was useful in acute gonorrhoea. Airol, or Bismuth Oxyiodogallate, in a 1.5 to 2.5 per cent emulsion in water, injected three times a day and retained for ten minutes at each sitting, is also valuable. The effect is increased by adding 1 per cent Resorein and 0.25 per cent Zinc Sulphate. Cure was obtained in twenty cases within two weeks.

REFERENCES.—¹*Lancet*, 1925, i, 919; ²*Jour. Amer. Med. Assoc.* 1925, Jan. 17, 194; ³*Munch. med. Woch.* 1925, May 1, 717; ⁴*Jour. Amer. Med. Assoc.* 1925, lxxxiv, Jan. 31, 361; ⁵*Brit. Jour. Ven. Dis.*, i, No. 3, Oct.; ⁶*Jour. Amer. Med. Assoc.* 1924, Dec. 20, 2005, and *Jour. of Urol.* 1924, xii, No. 6, Dec.; ⁷*Dermat. Woch.* 1925, lxxx, 515.

GUINEA-WORM DISEASE. (See FILARIASIS.)

HÆMATURIA.*Sir John Thomson-Walker, F.R.C.S.*

Hæmaturia is a symptom, not a disease, and the cessation of the hæmaturia does not indicate that the patient is cured. This platitude cannot be repeated too often, for the patient at all times believes that when his urine clears the disease is gone, and, not infrequently, his doctor is inclined to agree with him.

A case of hæmaturia presents two problems to the surgeon. In the first place, the part of the urinary tract from which the blood comes must be precisely located; and secondly, the disease which causes the hæmorrhage must be diagnosed. In some cases the localization and the diagnosis are made simultaneously; when, for instance, the cystoscope reveals the cause of a symptomless hæmaturia as a papilloma of the bladder. But, on the other hand, the discovery of blood coming from one ureter only localizes the bleeding to that kidney without indicating the cause.

The papers here noted are entirely concerned with the causes of hæmaturia; they do not refer to the problem of localization.

E. A. Locke and G. R. Minot¹ discuss the principal diseases with which hæmaturia may be associated, excluding as far as possible those which directly affect the genito-urinary tract itself. When hæmaturia is due to systemic disease that does not primarily affect the urinary organs, there is as a rule some change in the urinary tract, the result of congestion, infection, or trauma; the development of abnormal tissue, e.g., new-growth; or some actual change in the blood itself, that leads to the appearance of the symptom in question. In all but a small percentage of obscure cases of hæmaturia, careful examination will reveal evidence of organic disease, usually of the urinary tract, so that the term 'essential hæmaturia' merely signifies the observer's inability to demonstrate the bleeding. Hæmophilia, characterized by prolongation of the coagulation time, was found to be associated with hæmaturia at some time during the course of the disease, by the writers in 20 per cent of their cases, and by Barney in 16 per cent. Retroperitoneal hæmorrhage producing congestion of the kidneys by pressure is said to be a factor. The bleeding is usually slight and of brief duration; if severe, one or more **Blood Transfusions** will usually stop it, for the donor's blood shortens coagulation time sufficiently to allow of healing of a small lesion. Cases are recorded in which death occurred from renal hæmorrhage in spite of repeated transfusions. It is the atypical and 'sporadic' cases, with no family history and with a history of only a few attacks of slight bleeding, in whom the coagulation time is not very prolonged, that are in danger of being overlooked.

Erythremia (Vaquez' disease), in which the greatly increased viscosity of the blood due to polycythæmia leads to a prolonged coagulation time, and a clot that may not retract in spite of a normal number of blood platelets, and in which vascular engorgement and capillary dilatation with the formation of small thrombi favour the occurrence of hæmorrhages, may be associated with profuse renal hæmorrhage. In the rare cases which do not show cyanosis, and in which the spleen cannot be made out to be enlarged, only careful examination of the blood can establish the diagnosis. In some forms of chronic nephritis, in which the colloidal state of the blood is apparently altered as a result of increased hydrogen-ion concentration without more than slight prolongation of the coagulation time, profuse hæmaturia may occur, with or without hæmorrhages into or from other parts of the body. Hæmorrhagic disease of the new-born, certain cases of sepsis, obstructive jaundice, and severe diseases of the liver are also mentioned as being occasionally associated with hæmaturia, and are characterized by prolongation of coagulation time of the blood.

Purpura hæmorrhagica, associated with a decrease, often marked, in the

number of blood platelets, is a condition in which spontaneous bleeding, not dependent on trauma but often intensified by it, may show itself as hæmaturia, which may be profuse, especially in the acute and subacute cases. It is in the chronic form that mistakes in diagnosis are likely to occur, so that a history of bruising easily but not severely, or of having observed a few petechiae in various parts of the body, in the presence of hæmaturia, should lead to a careful examination of the blood. Purpura hæmorrhagica may be symptomatic of a number of diseases, either because of increased destruction of platelets, as in certain infectious conditions, or because of diminished formation of platelets, as for example in benzene poisoning, influenza, aplastic anæmia, multiple malignant metastases of bone, or diseases such as leukæmia and pernicious anæmia.

Hæmaturia was present in 15 per cent of 110 cases of chronic myelogenous leukæmia, and was marked in 2 cases; it was also present in 20 per cent of 80 cases of chronic lymphatic leukæmia. Hæmaturia associated with thrombopenia occurs in both forms of acute leukæmia, especially as a late manifestation, when it is common and may be marked.

Lymphadenoma and lymphosarcoma, in which large lymph-glandular masses may encroach on the genito-urinary tract, as in some cases of lymphatic leukæmia, and in which 'growths' occur occasionally in the kidney and rarely in the prostate, may give rise to hæmaturia, usually painless, but occasionally associated with severe attacks of pain simulating appendicitis or renal colic, etc. In these conditions it is the local state of the tissues, and not that of the blood, which causes hæmaturia, while in lymphatic leukæmia one or both of these factors may be the cause. The combination of abdominal pain and hæmaturia in these diseases of the lymphatic tissues may occur when external manifestations of disease are slight; 3 such instances occurred in 125 cases.

The idiopathic forms of purpura (simplex, rheumatica, and Henoch's) are frequently associated with the presence of red corpuscles in the urine, and occasionally with profuse hæmaturia which may persist for weeks. Such findings in the urine of young people, without obvious exudative skin lesions, should lead to inquiry as to previous recurring urticaria, purpura, erythema, or angioneurotic edema, and joint or intestinal affections. The hæmaturias which may be associated with numerous infections, conditions causing chronic passive renal congestion, corrosive and irritant poisons, etc., are also considered, and mention is made of the hæmaturia sometimes found in cases of oxaluria.

F. J. Parmenter² advocates the careful examination of the urine for tumour-cells in all cases of hæmaturia before proceeding with cystoscopic examination, and describes two cases in illustration of the value of this. Only positive results are of value, and the writer gives details of his technique for the cytological examination of the urinary sediment in such cases.

B. A. Thomas,³ in a paper on hæmaturia of bladder origin, states that of 6320 patients with genito-urinary lesions, 430 had hæmaturia, in 216 of whom the bleeding was of vesical origin, the commonest lesions causing this symptom being tumour, inflammation, and calculus. The important point is that no case of hæmaturia should be treated expectantly. Immediate steps must be taken to ascertain the cause, on the early discovery of which prognosis and effective treatment so greatly depend.

Discussing hæmaturia of prostatic and urethral origin, W. H. McNeill, Jr.,⁴ states that infections of the urethra, prostate, and seminal vesicles, of which gonococcal infection is by far the most frequent, are the commonest causes of this symptom. Traumatism, including the accidental or wilful injection of strong chemicals and introduction of foreign bodies into the urethra, comes

second in this respect. Adenoma and carcinoma of the prostate, next in order of frequency as a cause, form an important group, adenomatous enlargement being considerably more frequently associated with bleeding than carcinoma of the gland. Prostatic and urethral calculi, and tumours of the urethra, are among the more uncommon conditions to be borne in mind as causes of hæmaturia.

D. W. MacKenzie⁵ has found that out of 3800 consecutive admissions to the Urological Department of the Royal Victoria Hospital, Montreal, 821 came complaining of having passed blood in the urine at some time or other. In 344 cases the bleeding was of renal origin, the result of traumatism in 11, acute nephritis 7, chronic nephritis 16, tuberculosis 88, pyelitis, pyelonephritis, and pyonephrosis 132, calculus 64, malignant new growth 12, horseshoe kidney 3, infected double pelvis 8, polycystic disease 3. A ureteral source of bleeding was present in 90 cases, the result of calculus in 87, inflammatory stricture in 1, double ureter with calculus and infection in 2. Vesical bleeding was found in 174 cases, the result of traumatism in 6, acute and chronic inflammation 38, diverticula 4, calculus 39, malignant and benign new growths 87. The hæmorrhage was prostatic in origin in 119 cases, the result of acute inflammation in 10, tuberculosis 39, calculus 2, 'prostatism' 54, malignant new growth 14. In 60 the blood came from the urethra, as a result of traumatism in 13, acute inflammation 11, chronic inflammation 13, stricture 10, foreign body 1, and benign new growth (caruncles) 10. In 34 cases no cause for the bleeding could be found.

H. L. Kretschmer⁶ has reviewed 933 consecutive cases of hæmaturia, excluding, however, those due to acute gonorrhœal infection, those following on injuries of the kidney, bladder, and urethra, and those the result of the passage of sounds, cystoscopes, and bougies. Of the 833 cases in which a diagnosis was made, the hæmaturia in 331 was of renal origin, thus: tuberculosis 80, calculus 71, pyelitis 58, malignant tumours 37, nephritis 31, pyelonephritis 13, hydronephrosis 12, polycystic disease 7, doubtful tuberculosis 5, pyonephrosis 4, syphilis 2, pyelitis follicularis 1, infarct of kidney 1, movable kidney 1, hydatid disease 1, pyelitis of pregnancy 4, and 'hæmaturia of pregnancy' 2. Lesions of the bladder accounted for 307: carcinoma 163, papilloma 72, calculus 31, tuberculosis 14, cystitis 6, 'elusive ulcer' 5, diverticulum 4, 'encrusted' cystitis 3, 'polypi' 3, ulcer 2, cystitis cystica 1, chronic cystitis due to ovarian abscess 1, angioma 1, and ruptured artery 1. Prostatic lesions gave rise to 126 cases: 'hypertrophy' 64, carcinoma 43, prostatic bar and bladder diverticulum 5, calculus 4, prostatic bar 3, tuberculosis 3, abscess 2, and hypertrophy with carcinoma of the bladder 2. A ureteral origin of bleeding occurred in 54 cases: calculus 48, stricture 5, and carcinoma 1. In only 6 cases was the urethra the source: papilloma 2, stricture in female 2, prolapse in female 1, and 'polyp' of the posterior urethra 1. In 9 cases some general disease was considered to be the cause of the hæmaturia: purpura 4, hepatic cirrhosis 2, hæmophilia 1, Banti's disease 1, and phosphaturia 1. In 12 cases no diagnosis was made; they were seen at a time when there was no active bleeding, and all modern methods of examination gave negative findings. From the above analysis it will be seen that tumour, stone, tuberculosis, simple infection, and nephritis are the most frequent causes of hæmaturia.

L. Herman,⁷ in a paper on renal hæmaturia, states that the differential diagnosis between a bleeding polycystic kidney in the absence of a bilateral renal enlargement, and a renal neoplasm, is exceedingly difficult if not impossible, and that pyelography may be the only means of establishing the diagnosis, short of operation. He reports a case of traumatic rupture of a horseshoe

kidney, the result of a buffer accident, in which the isthmus joining the lower poles of the kidneys was torn across completely, and he states that he has been able to find a record of only one other case in the literature.

G. R. Livermore⁸ reports 5 cases of renal hæmaturia: 2 due to stricture of the ureter, 1 to undue renal mobility, 1 to infection in a kidney the seat of polycystic disease, and 1 to renal tuberculosis. Among the more obscure causes of renal hæmaturia the following conditions are mentioned: chronic nephritis localized to the region of the renal papillæ, with or without a varicose condition of the veins of one or more of the papillæ; very small and early foci of renal tuberculosis; secondary or tertiary syphilitic changes; bacterial invasion of the renal pelvis and focal infections of the parenchyma; and lastly, the presence of microscopic calculi in the renal papillæ. The existence of chronic passive congestion of the kidney for any reason is stated to be an important factor in some cases of obscure renal hæmorrhage.

A. L. Chute⁹ has analysed 100 consecutive cases of hæmaturia in which a definite diagnosis as to the cause of the bleeding was arrived at. In 14 the prostate was the seat of bleeding: adenomatous hypertrophy in 9, carcinoma in 4, and abscess in 1. A bladder origin was found in 46: infiltrating 'adenocarcinoma' in 25, papillary carcinoma 10, simple papilloma 1, vesical calculus 2, 'spinal cord bladder' 2, vesico-intestinal fistula 1, cystitis 2, ulcer of bladder 2, and rupture of the bladder 1. The ureter accounted for 7 of the cases: stone in 5, and ureteral 'dilatation' in 2. In 40 the blood was of renal origin: calculus in 10, tumour 5, hydronephrosis 8, congenital cystic disease 1, tuberculosis 7, pyelonephritis 6, rupture of the kidney 1, and nephritis 2. In 7 of the patients there was a double lesion, thus accounting for the 107 lesions mentioned as causing bleeding in the 100 cases under review.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, Oct. 25, 1311; ²*Surg. Gynecol. and Obst.* 1925, April, 531; ³*Jour. Amer. Med. Assoc.* 1924, Nov. 1, 1392; ⁴*Ibid.* 1395; ⁵*Surg. Gynecol. and Obst.* 1924, Aug., 155; ⁶*Ibid.* 1925, May, 683; ⁷*Jour. Amer. Med. Assoc.* 1924, Oct. 25, 1315; ⁸*Ibid.* Nov., 1390; ⁹*Ibid.* 1924, Oct. 25, 1321.

HÆMOCHROMATOSIS.

Ivor J. Davies, M.D.

E. S. Mills¹ gives an account of 17 cases of hæmochromatosis. While a clinical diagnosis can only be made in the late stages when signs and symptoms of cirrhosis of the liver are accompanied by pigmentation of skin and diabetes, the pathological diagnosis can be made at all stages of the disease. In this series of 17, only 2 were diagnosed during life, and proved positive by the demonstration of hæmosiderin in an excised bit of skin. It is a rare malady. Mallory, Parker, and Nye² have recently demonstrated cirrhosis in rabbits produced by chronic copper poisoning, and that the lesion is similar to that in hæmochromatosis characterized by the deposition of hæmofuscin in the liver and other cells. In course of time the pigment very slowly changes to hæmosiderin. Mills states that the clinical records of his cases are strongly suggestive, but not convincing, of copper poisoning. The likely sources of such poisoning are inhalation and swallowing of copper dust, and excessive indulgence in distilled liquors. One of the patients had been 'milling and turning copper and brass' for twelve years. Youth is not affected. Sprunt³ states that the age period of the disease is from 30 to 70 years. The advanced age of onset is a strong argument in favour of the view that the lesion is chronic and requires ten years at least in which to develop. It is rare in women 'owing to the less exposure to poisoning'.

The signs and symptoms are those of cirrhosis of liver, pigmentation of skin, and sclerosis of pancreas, in order of occurrence. The size of the liver depends on the stage of the process, the quantity of toxic agent ingested, the amount of inflammatory reaction to the injury produced by it, and the presence or

absence of regeneration. In the early stages enlargement is usually found; later, when the stroma contracts, the organ diminishes in size. If the changes are rapid, blocking of the blood-vessels and bile-ducts results, and ascites and jaundice take place. The spleen is not constantly enlarged.

The pigmentation of the skin is due to two sources: first, the hæmatogenous pigments hæmofuscin and hæmosiderin, which give a dirty-brown discoloration of the skin; secondly, increase of melanin due to injury of the adrenals by accumulation of the hæmatogenous pigments there. Diabetes is always a late symptom, and is due to the pigmentation, necrosis, and sclerosis of the pancreas. Mills states that primary liver-cell carcinoma is not an infrequent sequela of this malady.

REFERENCES.—¹*Arch. of Internal Med.* 1924, Sept., 292; ²*Jour. Med. Research*, 1921, xliii, 461; ³*Arch. of Internal Med.* 1911, July, 75.

HÆMORRHAGE IN THE NEWBORN. (See NEWBORN.)

HÆMORRHOIDS.

J. P. Lockhart-Mummery, F.R.C.S.

Treatment of Internal Piles by Injection.—A number of papers bearing on this subject have appeared during the year, and it was one of the subjects chosen for discussion at the Joint Meeting last year in London between the American Proctological Society and the sister society of England. The late Mr. Graeme Anderson, who opened the discussion, described the method very fully.¹ He traced the history of the treatment back to the year 1869, and remarked that it has been practised more or less continuously for fifty-six years, and that there is, therefore, nothing very new about it. He pointed out that cases suitable for the treatment require to be carefully selected if good results are to be obtained. The following he excluded as unsuitable: (1) Cases of piles complicated by fissure, fistula, or any large external skin tags; (2) Inflamed or ulcerated piles; (3) Cases where the piles are very large and of old standing, or have undergone fibrotic changes. He stated that one of the greatest mistakes often made with regard to this method of treatment is in supposing that it is of universal applicability.

Technique.—The best position for giving the injections is with the patient on the left side in semi-prone position. No anæsthetic, either local or otherwise, should be required, as the injections are not painful if properly given. A good headlight is essential, and a suitable speculum must be used. Mr. Anderson, following the custom at St. Mark's Hospital, strongly advocated what is known as the St. Mark's pattern speculum. The best fluid for the injections he considered to be a 10 per cent solution of Carbolic Acid in equal parts of glycerin and distilled water. A special syringe must be used. The pile selected for treatment is made to prolapse into the end of the speculum, and the point of the needle is then inserted well into the centre of the pile rather towards the upper part, and from 5 to 20 min. of the solution is injected, the needle being moved into different parts of the pile so as to spread the fluid in the tissue. The actual amount of fluid injected must depend upon circumstances and the size of the pile, etc. On no account should the solution be injected just under the mucous membrane. It is not held advisable to inject more than two or at the outside three piles at one sitting. The patient is allowed to continue his ordinary life, and is not obliged to lie up. If properly done, no pain is experienced as a result of the treatment. Mr. Anderson stated that he had tested at St. Mark's Hospital various other drugs for injection, such as ergot, perchloride of iron, alcohol, formalin, quinine urea, and quinine, but he found that the best results were obtained by the carbolic solution already mentioned.

Recurrence of the piles after the injection treatment is rather common; in fact they amount to nearly 50 per cent: but the treatment can be repeated, so that this is not so serious as it might appear. Practically all complications arise from injecting unsuitable cases, or from bad technique. Considerable practice is necessary to enable good results to be obtained. It is quite a mistake to suppose that it is a method that anyone can acquire from a written description. Practice under proper tuition in the out-patient department of a hospital is the only satisfactory method of acquiring the necessary technique.

A paper contributed by Dr. Dukes, the pathologist at St. Mark's Hospital, and published with Mr. Anderson's paper, is of particular interest as showing exactly what happens to the piles as the result of injection. Dukes states that the pathological changes provoked by carbolic-acid injections have been studied microscopically in ten patients, in each of whom one pile was injected in the usual way, and this injected pile, together with a control not injected, was subsequently removed by operation—in one patient in one day, in the remainder after 2, 3, 4, 5, 6, 7, 12, 14, and 21 days. The pieces of tissue were

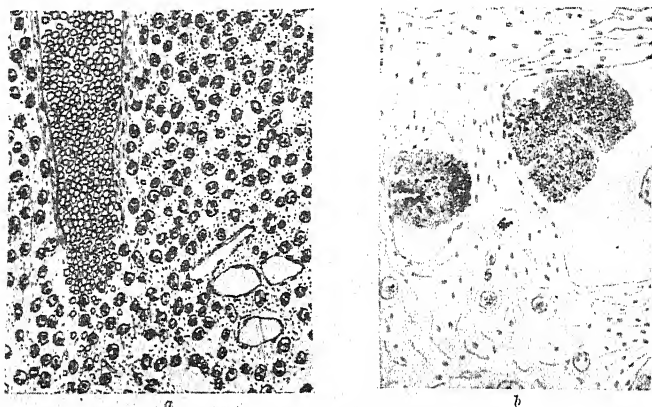


Fig 23.—Pathological changes in piles removed after injection with carbolic acid.
(a) One day after injection; (b) Five days after injection. (Dr. C. E. Dukes.)

fixed, embedded in paraffin, and serial sections cut from the injected pile and control pile of each patient.

The pile removed *one day after injection* showed the vessels dilated and engorged with blood, and the surrounding tissues œdematous, containing much extravasated blood, and infiltrated with polymorphonuclear leucocytes (Fig. 23, a). There was clear evidence of active emigration of these through the vessel walls into surrounding tissues. No signs of thrombosis were seen. The chief feature at this stage was the close packing of the œdematous tissues with innumerable polymorphs.

The pile removed *three days after injection* did not show any noteworthy change in the vessels themselves, but the surrounding tissues were still œdematous, and contained extravasated blood, masses of polymorphonuclear leucocytes, some lymphocytes, and many large mononuclear cells. The abundance of these large mononuclear macrophages was the characteristic feature at this period. Many were actively phagocytic and had ingested red blood-cells or leucocytes. Proliferation of the fixed connective-tissue cells was noticed at the margin. There was no evidence of thrombosis in any of the vessels.

The pile removed *four days after injection* presented much the same appearances as its predecessor; but the leucocyte infiltration was less conspicuous and the macrophages were relatively more numerous. These large mononuclear cells were arranged in clusters round the blood-vessels. No sign of thrombosis was detected.

The pile removed *five days after injection* (Fig. 23, b) showed commencing thrombosis in many vessels. No intravascular clotting was seen in the control injected pile from the same patient. The polymorph infiltration of the surrounding tissue had almost disappeared; but large mononuclears and young connective-tissue cells were plentiful.

In the piles removed *seven, fourteen, and twenty-one days after injection*, thrombosis was found in each case; but apart from some increase in fibrous tissue and the budding of new capillaries no other significant change was noted.

Manner of Action of Carbolic Acid.—Carbolic acid, being a powerful irritant to the tissues, initiates an aseptic inflammation, characterized by dilatation of the vessels, emigration of leucocytes, and transudation of lymph. By these means the alien liquid is diluted and removed; thereafter the inflammation quickly subsides. All the changes observed microscopically represent the efforts of the tissues to repair an injury. The curative effects of injections of carbolic acid do not depend upon any specific action of this chemical substance. The early inflammatory changes which occur in the first three days do not play any important part in the cure of piles; it is the secondary changes, in particular the intravascular clotting, and subsequent fibrosis, to which any beneficial effect must be ascribed.

Clamp and Caутery Operation.—Parker Syme² gives his results and comments on 600 cases of piles treated by the clamp and cautery operation. Sacral anaesthesia alone was used in 64 cases with 3 failures. The author is much in favour of sacral anaesthesia for this operation. [Admittedly it has many advantages, but our experience has been that there are two serious disadvantages: (1) the proportion of failures is too high, and (2) induction is too 'slow'—twenty minutes at least is required to obtain sufficient anaesthesia. Syme is much in favour of the clamp and cautery operation, claiming for it freedom from pain, quick healing, and good after-results; but he does not give the end-results of his 600 cases. He describes dilatation of the sphincter muscle as the first stage of the operation; but this practice has been entirely discarded for the last ten years at St. Mark's Hospital as an unnecessary trauma. The clamp and cautery operation admittedly gives very good results in the treatment of internal piles, but has proved distinctly inferior to the ligature operation, when this is skilfully performed. Syme follows the usual American practice of letting his patients get up in four days and go about. This has not yet proved popular on this side of the Atlantic.—J. P. L.-M.]

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 100, and *Practitioner*, 1924, Dec., 399; ²*Surg. Gynecol. and Obst.* 1924, Sept., 349.

HAY FEVER.

W. H. Wynn, M.D., F.R.C.P.

In America, hay fever is much more prevalent than in this country, and is the subject of elaborate investigation. In California, at least three seasons can be defined, corresponding with the times of pollination of different groups of plants. G. Piness¹ maintains that before hay fever can be treated intelligently it is necessary to have a complete survey of the neighbouring flora, and a chart of the pollen-bearing plants and their seasons of pollination. These surveys have been made for several districts. Piness enumerates 41 pollens in order of importance, and these are only part of 128 varieties common in his locality. Extracts of each variety of pollen are made, and the patient is

tested with the appropriate pollens according to the season. Tests are made by the scratch method. A true reaction should show pseudopodia, and a wheal of at least 0.5 cm. in diameter, surrounded by erythema. Various writers have stated that a patient sensitive to any grass may be Desensitized by an extract prepared from any other of the same grass family, this being especially true of Timothy grass, but Pines does not agree with this. He also finds that at least 87 per cent of patients are multiple sensitive, which makes it impossible to treat with a single pollen extract. He prepares as many antigens as a patient requires, but never incorporates more than three pollens in one vaccine. The initial dose is determined by testing with various dilutions. The first dose is 0.1 c.c. of the dilution next below the one that gave a positive skin reaction. Most of the patients reacted to a dilution of 1-10,000, and treatment began with the 1-20,000 dilution. Pre-seasonal desensitization is the method of choice, and about 23 per cent of patients get complete relief. Seasonal desensitization should be attempted in cases seen too late for the former method, as a fair percentage are given partial if not complete relief. H. S. Bernton² calls attention to cases due to pollen of members of the plantain family, as he found 4.3 per cent of 116 patients sensitive to this, or, taking patients suffering from vernal hay fever only, 16.6 per cent were sensitive to plantain pollen. Relief was obtained by desensitization with the appropriate pollen.

A. A. Eggston,³ in a series of 424 cases, found 71.2 per cent sensitive to weed pollens, with symptoms in August and September; 21.1 per cent were sensitive to both grass and weed pollens, with symptoms from May to October; 6.7 per cent to grass pollens, having only hay fever in May and June; and 1 per cent were sensitive to tree pollens, with symptoms in April and May. Ragweed pollens were the predominant agent in the late summer cases. Many patients complain of hay-fever-like symptoms throughout the year without seasonal periodicity. These cases are referred to as vasomotor rhinitis, rhinorrhœa, or perennial hay fever. One hundred and fifteen were tested for sensitization, from 50 to 150 food, pollen, animal, or bacterial extracts being used. About 10 per cent showed reactions which proved to be of importance. The most common substance responsible was orris root, an important constituent of rouges, face and hair cosmetics, and household powders. Of the non-allergic types, nearly all showed some endocrine imbalance. It would seem that any undue taxation of the autonomic nervous mechanism through fatigue, toxæmia, faulty metabolism, or hypo- or hyperendocrine function will result in sympathetic reactions of which vasomotor rhinitis and allergy are related expressions.

J. Freeman⁴ states that intravenous injection of 500 units of a pollen extract would probably kill a hay-fever subject, but 20,000,000 units had no effect upon a rabbit. Therefore the condition could not be a toxic one. He was not himself sensitive to pollen, and could put into his veins twenty times the dose that would kill a sensitive person, and feel no ill-effects from it. Practically all sufferers from this form of rhinorrhœa agree that their worst troubles were in connection with the eye, others of less moment being the irritation of the nose, mouth, and skin. If the substance was put into a sensitive person's food or drink, diarrhœa and faintness would result. One investigator put pollen into the rectum, and pruritus ani occurred. Angioneurotic œdema followed injection into a vein. Other conditions which might occur were giant urticaria, asthma, migraine, epilepsy, also arthritis, colitis, and nephritis in paroxysmal attacks.

Brown Kelly,⁵ in order to reduce the nasal hyperæsthesia in rhinorrhœa, had frequently used Alcohol Injections into the regions traversed by the two principal nerve-trunks, with success. He believed that the alcohol acted as

a nerve-block. R. J. Payne⁶ has made alcoholic injections into the nasal ganglion of 43 hay-fever patients with satisfactory results, varying from considerable amelioration to complete relief. In only 3 cases was there failure to produce any relief.

F. Coke⁷ discusses the treatment of hay fever. For *prevention*, one of two methods of *Desensitization* can be followed: (1) By using small doses of the pollen. The patient is tested with dilutions of the protein, and a dilution ten times weaker than that which gives an appreciable reaction on the skin is used. Starting with 2 min. of this, weekly or bi-weekly doses are given, increasing each dose by 1 min. until the next dilution is reached. The same doses are given of this dilution, and so on to the next higher one. This must be done very slowly, making frequent dermal tests to see how treatment is progressing. (2) *Desensitization* by non-specific methods. Probably any protein could be used, but with horse serum and some other proteins there is much risk of the patient being sensitive to them. Coke has found Danyasz's mixed coliform vaccine to be most effective. The vaccine should contain 40 per cent *B. coli*, 40 per cent of coliform variants, and 20 per cent of intestinal streptococci. Doses rising from 20 to 1000 million of these organisms are injected hypodermically once or twice a week according to the nearness of the hay-fever season. Treatment should be commenced in April and continued well into the hay-fever season. It will often stop hay fever even when violently active, though permanent desensitization is best conferred by an early course. These two methods should not be used together, for the pollen injections will defeat the objects of the mixed coliform vaccine. Collosol Calcium is of value given intravenously, $\frac{1}{2}$ to 1 c.c., when the hay-fever season is due. *Cauterization* of the nose is useful to reduce swollen mucous membrane by scarring, and also to destroy some of the nerve-endings and reduce sensitiveness. This should be done over the turbinates on both sides, and particularly on the septum anterior to the bony outlet of the nose. Vaseline or a liquid Paraffin spray helps to prevent the pollen reaching the mucous membrane. Adrenalin and Menthol will constrict the blood-vessels and lessen swelling. Cocaine and its substitutes reduce the intense irritation of the nerve-endings, and oily vehicles for these drugs soothe the mucous membrane and prevent fresh pollen getting to it.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, Feb. 21, 584; ²*Ibid.* March 28, 944; ³*Ibid.* 1924, Oct. 18, 1221; ⁴*Lancet*, 1925, i, 766; ⁵*Ibid.*; ⁶*Jour. Amer. Med. Assoc.* 1924, Sept. 13, 869; ⁷*Brit. Med. Jour.* 1925, i, 962.

HEALTH VISITORS, TRAINING OF. Joseph Priestley, B.A., M.D., D.P.H.

Grants are made from the Exchequer for the training of health visitors. Hitherto these grants were made through the Board of Education, but, from April 1, 1925, they are to be made by the Ministry of Health. The opportunity has been taken of revising the qualifications and experience necessary for candidates for appointments as health visitors, and it is clear, from the official circulars, that health visitors must be highly-trained and wide-experienced officers, who, in addition, must possess good sense and an acceptable personality. The *ideal* is a hospital-trained (three years' certificate) nurse, certified midwife, and the possessor of a diploma of special training designed to equip her with a knowledge of the preventive and public health aspects of her work. With a view to attaining such an ideal, it has been decided that, on and after April 1, 1928, no woman will be approved for the first time as a whole-time officer of a local authority with health-visiting duties unless, and until, she has attained such ideal, which has been slightly modified in the following particulars: (a) is a 'trained nurse' as defined in paragraph 1 of the conditions

of grant, and has obtained the certificate of the Central Midwives Board and has completed an approved course of training in public health work, lasting for at least six months; or (b) has undergone a course of training of two years' duration already recognized under the Board of Education (Health Visitors' Training) Regulations, 1919, together with six months' training in hospital, and has obtained the certificate of the Central Midwives Board. The practical instruction comprised in the six months' course of training in public health work is, as far as practicable, to be conducted in co-operation with the public health department of the local authority for the area in which the training is given.

The positions of *existing* health visitors are fully safeguarded by a guarantee from the Ministry of Health "to approve their appointments without further qualifications", but, at the same time, it is suggested that facilities should be given to existing officers (of five years' standing) to obtain the new certificate; and, further, that facilities should be provided for those who are already engaged in health visiting to obtain occasional 'refresher' courses. Grants are to be allowed in such cases by the Ministry of Health.

It is specially to be noted that the Minister of Health draws attention to the fact that, as training will necessitate three and a half to four years being spent in gaining knowledge and experience, the remuneration offered should be such as to be sufficient to attract (and retain) qualified women, who can reasonably be expected to render efficient service. This is really the crux of the situation. The training is increased in standard materially and compulsorily by a Government department, but the actual remuneration for services rendered is left in the hands of the local authorities, whose ideas on salaries for officers and employees are often niggardly, or may have that tendency.

HEART, ANEURYSM OF. (See ANEURYSM.)

HEART, ARRHYTHMIA OF.

J. E. MacIlwaine, M.D.

S. B. Boyd Campbell, M.D.

K. F. Wenkebach,¹ in a lecture delivered in Munich, dealt with disturbances of cardiac conduction from a somewhat new standpoint, namely, with regard to the *relationship between the rhythm of the heart and the recuperative phase of the heart muscle*. This way of looking at things contains, in his opinion, the further possibility of an explanation of the appearance of the most varying 'heterotopic' rhythms in the heart. The extrasystole, whether spontaneous or artificial, is one of these, and the more so the earlier in the diastole it occurs. Each part of the heart muscle, in theory each heart muscle fibre, which once contracts faultily from whatever cause at all, will be able to go on beating in its own quicker rhythm, by reason of its refractory phase being shortened by the faulty contraction, and by reason of its inherent automatic *Reizbildung*. According to the relation of the length of period of this new-born heterotopic rhythm to the frequency of the given nomotopic rhythm, such a spot may become the place of origin of one or more extrasystoles, of a paroxysmal tachycardia, or even of flutter and fibrillation. Wenkebach concludes by emphasizing two fundamental characteristics of cardiac muscle: (1) The volume of the venous inflow to the heart determines the degree of contraction (Starling); (2) The degree of contraction determines the duration of the refractory phase, the period of onset of the next systole, and the frequency, therefore, of the beat.

E. P. Carter, E. C. Andrus, and F. R. Dieuaide² think it likely that normal and abnormal rhythm alike are expressions of the inherent 'automaticity'

and 'conductivity' of different portions of the heart. Experimentally it was found possible to control the rate of the isolated perfused heart by changing only the reaction of the perfusing fluid from pH 7.0 to pH 7.8. The more alkaline the perfusate the more rapid the rate, and the less alkaline the slower the rate. The electrocardiographic record of a dog's heart is shown in *Fig. 24*. The P-R interval changes quickly with such alterations, lengthening in the less alkaline and shortening in the more alkaline fluid. They studied the reaction of the cardiac mechanism to anoxæmia, which may arise through asphyxiation or through circulatory disturbance. They point out that as a result of contraction there is a local increase of the hydrogen-ion concentration (diminished

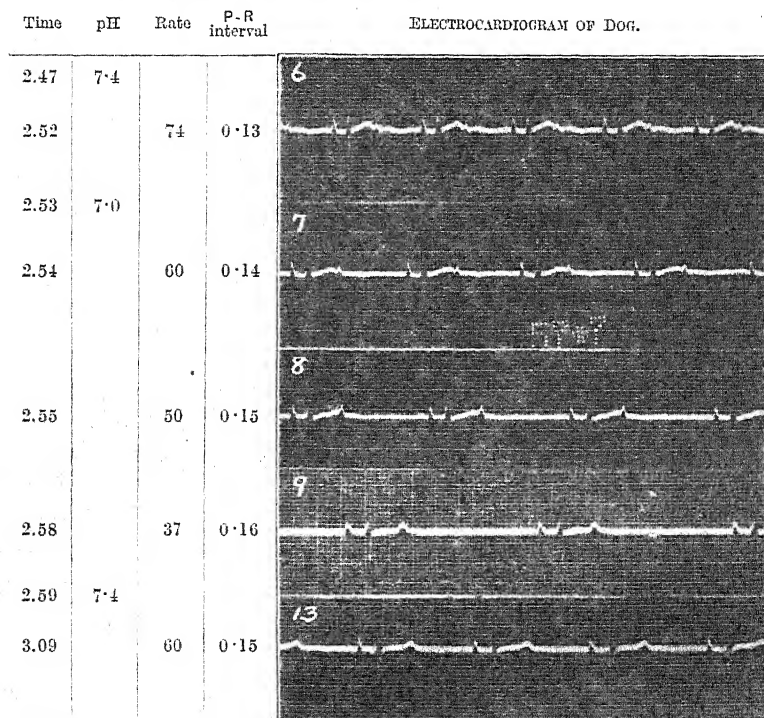


Fig. 24.—Electrocardiogram of a dog, showing the variations in rate and conduction time following changes in the hydrogen-ion concentrations of the perfusate. (Kindly lent by the 'Archives of Internal Medicine'.)

alkalinity), and the role of oxygen is to remove this. They note that definite improvement in cases of partial block has been obtained by administration of oxygen (Barach and Woodwell³). Coronary occlusion and its arrhythmia are explained on this basis. Anoxæmia pushed to a certain point is associated with: (1) Slowing of the sinus rhythm; (2) Interference with conduction; (3) The appearance of ectopic rhythm.

They conclude that *abnormalities of rhythm may possibly be explained on the basis of a local circulatory deficiency* involving either an inadequate removal of products of tissue metabolism or an insufficient supply of oxygen in that area.

Under these circumstances either an accumulation of waste products (an increase in the pH concentration) in the tissues locally may lead to a localized block, or a more rapid rise in the pH within the tissues may cause spontaneous excitation in that area. A minor disturbance may give rise to extrasystoles. A more serious disorder may result in a paroxysm of rapid excitation which for a time commands the rhythm of the heart. It is further suggested that in pathological conditions local accumulation of hydrogen ions may develop in nodal tissue or in various other parts of the heart, giving rise to heterogenetic beats or rhythm. Re-entrant waves and circus movements may be accounted for by regional or diffuse changes of the same nature. The mechanism by which pathological changes usually produce these results is a local increase in the hydrogen-ion concentration within the tissue, which is due to an insufficient supply of oxygen; on the other hand, a pathological process which causes a relative increase in the concentration of hydrogen ions in the tissue fluids interferes with the spread of the excitatory process, thereby giving rise to the various forms of 'block'.

CARDIAC EXTRASYSTOLES.

T. W. Griffith⁴ discusses fully the clinical aspect of this common irregularity, stating, "It seems a reasonable view to hold that isolated extrasystoles are due to the presence at their points of origin of some irritable focus from which at time to time discharge takes place." He points out that the preceding systole would almost appear to play a part in originating the one which succeeded, and that as a result one extrasystole may bring forth another until we may arrive at a paroxysm of tachycardia. He mentions the rhythmical appearance of these aberrant beats occurring over long periods, and suggests that the irritable focus may have a rhythm of its own. He considers it of extreme importance to recognize the extrasystole, but mentions that it may be almost impossible to do so without instrumental means. In regard to the prognosis, it is admitted that they may be of no import, but are more frequently present where some organic lesion exists, or as an associate of heightened tension. It is the associated condition which must govern any attempt to gauge their importance. With regard to treatment, **Exercise** should be taken, and a **Light Diet** prescribed. Coffee, tea, and tobacco may be factors in their production, and should be avoided. Digitalis should not be used. Oral sepsis should be treated.

E. W. Price⁵ emphasizes the great practical importance of extrasystoles. He mentions the importance of the auscultatory recognition of these contractions. He notes the occasional case in which extrasystoles, especially of auricular origin, give rise to a cardiac irregularity indistinguishable from auricular fibrillation, but points out that a sphygmographic tracing alone almost invariably gives a diagnosis. With regard to prognosis, extrasystoles considered by themselves, without reference to the condition with which they may be associated, are neither indicative of an impaired heart nor do they add to the gravity of any existing morbid condition. The treatment is that of the associated condition. Digitalis and quinidine are of no value. Bromides may be of benefit.

F. Schultze⁶ writes regarding Erb's personal self-observation upon an extrasystole. This famous physician noticed the irregularity when 29 years old; during 27 years it in no way impaired his mental or physical vigour; from 56 for the next 7 years he had attacks of tachycardia, which were disagreeable, but did not interfere much with his work or sport of mountain climbing. Subsequently he had only occasionally premature beats. At 70 he underwent a severe gall-bladder operation. He died at 83 of an infectious enteritis.

"The extrasystole is a harmless nervous disturbance of the heart, which requires no special therapeutic treatment of the patient." This opening statement Max Hertz⁷ supports by a full description of the condition, and emphasizes that the one effort should be to relieve the patient's mind. He points out that in spite of this the patient is often of the temperament to continue suffering. He remarks that this irregularity has commonly been noted by doctors who have suffered from it, and that many of them prevent or reduce the unpleasant sensations by neglecting them.

AURICULAR FIBRILLATION.

Carey F. Coombs and C. E. K. Herapath⁸ consider that there are four chief clinical manifestations of auricular failure: (1) Complete arrhythmia; (2) Disappearance of auricular systole and of the presystolic murmur if previously present; (3) All signs of circulatory stasis are increased; (4) In the jugular tracing and in the electrocardiogram evidence of a rapid irregular movement is visible. In every case of auricular failure examined carefully the musculature of the auricular walls had reached a pitch of deterioration so extreme that it was demonstrable by routine methods. The ventricular walls showed very minor changes.

Prognosis depends first of all on the nature of the underlying condition, whether it is transient or progressive, secondly on the state of the ventricles, and thirdly on the behaviour of the fibrillating auricles under the influence of the appropriate drug.

G. A. Allan⁹ compares his analysis of 320 cases of failing heart mentioned elsewhere (*see* HEART FAILURE) with those of auricular fibrillation. Failing heart cases gave breathlessness in 87 per cent; pain in 40 per cent; palpitation in 33 per cent; exhaustion in 24 per cent; cough in 21 per cent; hæmoptysis in 12 per cent; giddiness in 7 per cent; faintness in 4 per cent; embolism in 4 per cent; dropsy in 39 per cent. The proportion of symptoms in auricular fibrillation was roughly the same as in those of failing heart, the only difference being that dropsy was rather more frequent and occurred in 49 per cent of cases. Some cases have practically no symptoms and are able to carry on their work without treatment.

TREATMENT.—As regards the use of Quinidine, Allan states it is usually but not universally accepted that, in addition to the convenience of not having to take drugs, the heart that has its usual rhythm restored gives greater comfort and greater reserve to the patient than one which simply has its rate reduced by the continual use of digitalis.

T. Wardrop Griffith⁴ points out that auricular fibrillation may be ushered in by transient paroxysmal attacks, but occasionally may be quite a latent phenomenon. In discussing the treatment he refers to the importance of recognition of digitalis intoxication, emphasizing the occurrence of extrasystoles in this condition. He considers, however, that the presence of extrasystoles is not always a definite indication to stop the drug. Referring to quinidine and its use, he states that it has two actions: it lengthens the refractory period and slows the conduction in the auricular musculature. This lengthening of refractory period and slowing of impulse he uses to explain the breaking down of 'circuit' movement stimulation.

In connection with the action of quinidine in the treatment of heart disease, John Hay¹⁰ gives an analysis of 265 cases treated at different centres by various observers. In this series there were: (1) 166 patients suffering from auricular fibrillation and valvular disease of the heart; (2) 87 patients suffering from auricular fibrillation but no valvular disease of the heart (this group included arteriosclerosis, myocardial degeneration, one high blood-pressure, and syphilitic

disease); (3) 12 thyrotoxic cases, and cases with Graves' disease. The method of administration varied. The results in the three groups were: Group 1: 166 cases. Failure complete in 78, success temporary in 42; equals 120 ultimate failures. Success permanent in 46, i.e., 27.7 per cent of successes. Group 2: 87 cases. Failure complete in 28, success temporary in 24; equals 52 ultimate failures. Success permanent in 35, or 40.2 per cent of successes. Group 3: 12 cases. Failure complete in 3, success temporary in 1; equals 4 ultimate failures. Success permanent in 8. The combined figures of 263 cases are: Failure complete in 107, success temporary in 67; equals 176 ultimate failures. Success permanent in 89. Quinidine did, however, restore a normal rhythm in 156 of these patients, or in 59 per cent, though in 67 the fibrillation returned. Eight of the cases died suddenly, and embolism occurred in 7.

Cases unsuitable for quinidine are: (1) Badly damaged hearts with old-standing valvular disease, and especially if there is undoubted failure of compensation with venous engorgement; (2) Occasionally in a patient who has suffered severely from angina pectoris the onset of fibrillation is followed by the cessation of anginal pain, and restoration of normal rhythm might not be justified; (3) Idiosyncrasy to the drug; (4) Cases of acute or sub-acute infective endocarditis; (5) History of embolism would be a factor against the administration of quinidine.

S. Neuhof¹¹ treated 11 cases of auricular fibrillation at their own homes with quinidine sulphate; 3 were males and 8 were females; 6 had valvular disease, 5 myocardial disease. Of the 6 with valvular disease, normal rhythm was permanently restored in 2; in 1 the rhythm remained normal for two days; quinidine had no effect in regularizing the rhythm in the other 3. Of the 5 cases with cardiosclerosis, the rhythm was permanently restored to normal in 3; in the other 2 there was temporary normal rhythm for a day or two.

In experimental research on auricular fibrillation, C. P. Waldorp¹² finds that quinidine lengthens the refractory phase and reduces the excitability. It does not act upon the sympathetic, but depresses the vagus. His research confirms the view that Potassium increases the vagal tone and produces heterotopic impulses; potassium salts may prevent auricular fibrillation. He suggests that it seems rational to give potassium or food rich in potassium when fibrillation resists quinidine treatment. Foci generating abnormal impulses respond to potassium differently from those generating normal impulses. The heterotopic foci may be stimulated to a degree that may seriously impair the heart. Potassium salts may prevent auricular fibrillation by reinforcing the normal foci. Potassium is indispensable for the normal automatic heart-beat. In the experiment it did not prevent fibrillation, but reduced the excitability of the auricle and ensured more rapid recuperation.

In trying to prove the value of quinidine in the treatment of auricular fibrillation, S. A. Levine and A. Wilmaers¹³ point out that two symptoms, dyspnoea and palpitation, are of different origin, and that dyspnoea is the cardinal symptom to be observed, stating that clinically the vital capacity of the lungs varies quite closely with the improvement in the signs of congestive heart failure; such determinations were therefore made with a hope of finding out what value quinidine sulphate might have in patients with auricular fibrillation. They observed 88 patients, one with auricular flutter. Quinidine 0.2 gm. was given twice a day, then 0.3 or 0.4 gm. three times a day, increasing by 0.1 gm. daily until rhythm was restored or the attempt given up. In no case was more than 0.7 gm. given. The vital capacity was carefully recorded. Five patients changed from auricular fibrillation to flutter; 2 of them became regular, 3 returned to auricular fibrillation. There were

3 fatalities, 1 in a case of extreme cardiac failure, the other 2 in well-compensated cases. The authors believe these were a result of a toxic phenomenon. They mention a case of mitral stenosis which they believe also died a toxic death from quinidine. They state that the rhythm of the heart became regular in 13 cases; in only 4 did the regular rhythm persist longer than one month, and never after nine months. They found that no important change in the vital capacity of the lungs could be attributed to quinidine. They believe that "the use of quinidine should not become general, but should be confined to a few who might still be making careful observations as to its proper place in the treatment of heart disorders".

TACHYCARDIA.

Paroxysmal Tachycardia.—"Paroxysmal tachycardia may be defined as a condition in which, from time to time, the normal mechanism is interrupted by a series of rapid, regular beats varying in rate between 100 and 220 each minute, the series starting and ending abruptly". This definition by F. A. Willius and A. R. Barnes¹⁴ applies to simple paroxysmal tachycardia. There are two other types, paroxysms of auricular fibrillation and auricular flutter. During the years 1914-23, 102 cases of paroxysmal tachycardia were seen in the cardiac service of the Mayo Clinic in which electrocardiographic tracings were obtained during the attacks. The cases were divided into groups as follows: (1) 36 cases of nodal tachycardia, which were subdivided into 5 cases in which the P-R interval was diminished, 28 cases in which the P-R interval was zero, and 3 cases in which there was an R-P interval; (2) 7 cases of auricular tachycardia; (3) 6 cases of ventricular tachycardia; and (4) 53 cases of auricular flutter. The paper deals especially with prognosis, and is summarized as follows:—

Of a group of 102 patients with paroxysmal tachycardia, 85 were traced; 59 per cent were males, and 41 per cent females. The greatest number were in the sixth decade in each sex.

The occurrence of vertigo as a symptom of paroxysmal tachycardia seemed to be determined largely by the co-existence of arteriosclerotic processes by which the blood-supply to the brain was probably diminished. Pain was confined practically to those cases in which there were co-existing arteriosclerotic processes affecting the aorta and coronary arteries. Vertigo, syncope, and 'spells of unconsciousness' should always lead to the consideration of attacks of paroxysmal tachycardia as a cause.

Of the 58 patients traced by questionnaire, 36 report that they are still having attacks of paroxysmal tachycardia. Only one patient was bed-fast at the time the questionnaires were returned.

Of the 85 patients traced, 25 had died. Only 20 of these deaths could be attributed to cardiac disease, making a total death-rate of 24 per cent. The total death-rate among males (26 per cent) is slightly above that for females (21 per cent).

Of 48 patients with minimal or no cardiac findings at examination, 5 (10 per cent) died from cardiac disease. Of 36 patients with definite findings of cardiac disease, 15 (42 per cent) died.

The death-rates were high in cases of paroxysmal tachycardia associated with aortic and coronary disease (57 per cent), and with endocarditis (46 per cent). The estimation of the prognosis of paroxysmal tachycardia, so far as this study is concerned, consisted very largely of the estimation of the type and degree of the underlying cardiac damage.

TREATMENT.—J. Crighton Bramwell¹⁵ says that tachycardia may demand treatment on account of rapid heart action, or on account of its manifestation

as palpitation. He divides it into primary tachycardia, where the disturbing factor lies within the heart itself, and secondary tachycardia, where it is secondary, indirectly or reflexly produced by the effects of a lesion in some other organ of the body.

In the secondary tachycardia he notes two important criteria: (1) The heart's rhythm is regular; (2) The rate is highly susceptible to variation in response to change of posture or emotion. With these criteria heart disease may be ruled out. The treatment of these cases of secondary tachycardia is the treatment of the cause, and reassuring patients.

In primary tachycardia physical exertion must be restricted, and the diet carefully regulated. Auricular fibrillation he treats with *Digitalis*, pointing out that its absorption from the alimentary tract is complete in six hours, whereas *strophanthus* is most uncertain as regards absorption. He gives *Morphine* often in conjunction, $\frac{1}{2}$ gr. He discusses the use of *Quinidine*, and points out its unsatisfactory effect where the myocardium is damaged. He gives 6 gr. every three hours for 5 doses, after excluding the possibility of idiosyncrasy.

As regards auricular flutter, he states that *digitalis* may give rise to fibrillation, and the ventricular rate may be controlled in some cases for years.

In paroxysmal tachycardia he notes the fallibility of all methods, including vagal stimulation, induction of vomiting, deep respiration, etc., and elimination of toxic factors. He mentions the occurrence of paroxysms of auricular fibrillation.

HEART-BLOCK.

T. Stuart Hart¹⁶ considers that lesions of the right branch of the bundle of His are not uncommon. Lesions of the left branch are rare. The electrocardiographic curves of two cases associated with complete *a-v* block are presented and discussed. These lesions have been seen only in cases of advanced heart disease, and a high mortality is to be expected. The administration of *digitalis* produces conspicuous changes in the graphic records. Several curves are presented illustrating the clinical analogues of the dextrocardiogram, levocardiogram, and bicardiogram which others have produced experimentally.

A case of heart-block due to gumma of the ventricular septum is reported by N. E. Clarke and F. J. Smith.¹⁷ The diagnosis of gumma was conclusively proved by the demonstration of the *Spirochaeta pallida* in the ventricular tissues. The possibility of gall-bladder infection as a primary or accessory cause of heart-block is also discussed, and a case illustrating the possibility is presented in which the heart regained and has maintained normal sinus rhythm since the removal of the infected gall-bladder.

The possibility of using *Adrenalin* in the treatment of Stokes-Adams attacks has been raised by pharmacological evidence of its power to increase auricular and ventricular rates experimentally, and even to reduce animals' ventricular block. J. Parkinson and C. W. C. Bain¹⁸ describe a case where there appeared to be an acute lesion of the myocardium involving the *a-v* bundle, with a rapid onset of heart-block, and a period of complete dissociation, followed by a gradual recovery of conduction. The Stokes-Adams syndrome occurred in all three phases, but much the greater number of attacks took place during the recovery of conduction. The action of *adrenalin* was studied both when block was partial and complete. On the 12 occasions on which it was used it abolished the attacks within three minutes, and freedom from attacks was maintained from two to forty-eight hours from the time of injection. On 4 recorded occasions when partial block was present the auricular and ventricular

rates both increased to 120, and normal *a-v* sequence was restored. When complete block was present and the ventricular rate was slow, this was increased to about 60, but the block remained complete. On one occasion when the ventricular rate was already 60 before the injection, no increase in rate took place. Adrenalin is not successful in every case, as they found in two of their cases; but they consider that its subcutaneous injection, 5 to 10 min. (0.3 to 0.6 c.c.) of 1-1000 solution, is the most promising method of treating Stokes-Adams disease, and should therefore be tried in every case.

PULSUS ALTERNANS.

Two types of pulsus alternans are specified by Regnier.¹⁹ In the incomplete juxta-maximal type, in which the phenomenon is recorded near to the maximum arterial tension, he believes the prognosis is relatively favourable, noting one patient who survived eleven years. The other, or complete, type (juxta-minimal) may be registered during the whole of the sphygmomanometric scale down to the limit of the lowest tension. This is of much graver prognosis. He notes death occurs usually in a few months to a year. Only one patient survived for two years.

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HEART-BLOCK. (See HEART, ARRHYTHMIA OF.)

HEART, CONGENITAL MALFORMATION OF. J. E. MacIlwaine, M.D. S. B. Boyd Campbell, M.D.

Patent Ductus Arteriosus.—E. Holman¹ considers that patent ductus arteriosus may be considered as an arteriovenous or a veno-arterial fistula resulting in an abnormal routing of a part of the circulatory blood. The blood flowing through the ductus may proceed from the pulmonary artery into the aorta, or from the aorta into the pulmonary artery. There are two types. In the first a larger volume of blood flows through the right heart than through the left. In the second a larger quantity flows through the left heart. The author cites 28 cases: 16 were of the first type, and showed an hypertrophied right heart in most cases equal to or greater than the left, with a dilated tricuspid ring, a dilated pulmonary artery, and a dilated aorta beyond the entrance of the patent ductus; 9 cases were of the second type, with a preponderant hypertrophy of the left heart, and a dilated aorta to the point where the ductus was; 3 cases are cited in which there were no cardiac changes. In cases with cyanosis, the hearts all fell into the first group.

REFERENCE.—¹*Johns Hop. Hosp. Bull.* 1925, Jan., 61.

HEART DISEASE, GENERAL THERAPEUTICS. (See also HEART, ARRHYTHMIA OF.) J. E. MacIlwaine, M.D. S. B. Boyd Campbell, M.D.

Digitalis (see also PHARMACOLOGY).—A. R. Cushny,¹ in a monograph on digitalis and its allies, has given to scientific medicine an invaluable contribution. From the similarity of their action many drugs can be classified with digitalis, the most commonly so associated in clinical medicine being squill, strophanthus, adonis, convallaria, etc.

PHARMACOLOGY.—Cushny describes two stages in the action of digitalis on the normal mammalian heart: the first characterized by increased contractility and inhibition, the second by impairment of conduction and occurrence of spontaneous rhythm in different parts. In the first stage the cardiac output is increased, the greater force of the beats more than compensating for their diminished number. The inhibition not only slows the heart—chiefly by lengthening the diastolic pause—but also retards conduction of impulses from the auricles to the ventricles. It is prevented or removed by atropine, or by section of the vagi. Before the end of the first stage inhibitory slowing may have become so great that the total cardiac output is much reduced, although the output per beat remains greater than usual. This period of successive inhibition does not occur if atropine has been given. The therapeutic value of digitalis is confined to the first stage of its action, and “it may be taken that in therapeutic doses digitalis increases the amount of blood expelled by the heart per unit of time and thus augments its efficiency”. The reduced rate of *a-v* conduction caused in normal mammals by therapeutic amounts is found to depend on vagal inhibition; it is not ordinarily observed where atropine has been given, although even then if the heart is artificially accelerated to a sufficient extent some slowing of conduction may be detected, and this slight effect is ascribed to a direct action on the conducting bundle. Changes in the T wave of the electrocardiogram are sometimes produced by therapeutic doses of digitalis, but they vary in character and are often negligible. The second stage of digitalis action does not occur in therapeutic use, or even in digitalis poisoning in man. In this stage the reduction in conductivity gradually loses its inhibitory origin and becomes entirely due to a direct effect on the conducting fibres. The action on cardiac muscle is also shown by a great increase in the tendency for spontaneous beats to arise in different portions of the heart.

Therapeutic doses in man cause no significant rise of blood-pressure. “The absence of effect on the general blood-pressure in man has been confirmed by so many observers that it no longer admits of question.” The nausea and vomiting which may occur in treatment with members of the digitalis group are probably due rather to an action on the medulla than to their local irritant effect in the stomach. Purgation is also to be attributed to an action on the central nervous system. Hence, attempts to obtain less irritating preparations of these drugs are of small value. Diuresis is probably due not to an action on the kidney but to dilution of the blood, the improved general circulation permitting more rapid absorption of fluid from the tissues. Digitalis is not absorbed from the stomach. It is rather slowly and very incompletely absorbed from the intestine, a large proportion being destroyed in the alimentary tract. Hence the intravenous dose of glucosides of this group is very much smaller than the oral. With regard to cumulation, “the symptoms arising from the prolonged use of small quantities of digitalis are identical with those of one large dose, and like these disappear when the treatment is stopped. The cumulative action of digitalis is the cause of much apprehension, but is not so dangerous as is generally stated”. The action of the drug continues for several days after administration has ceased. “The slow elimination may really be regarded as an advantage as giving stability to the treatment; the action is a progressive one without any variations from hour to hour, and this must be an advantage.”

THERAPEUTICS.—“It is now generally accepted that the beneficial results of digitalis treatment cannot be ascribed to any one (of its effects), but that in one type of heart lesion the improvement is due to the change in conductivity, for example; in another to the increased contraction and greater output;

and in a third to some other feature of its action". The view that digitalis is contra-indicated by aortic regurgitation "fails to take account of the fact that when the heart is slowed by digitalis its beat is also strengthened, and there is an increase in the output per unit of time which would more than compensate for any slight increase in the regurgitation." The less favourable results obtained in aortic than in mitral disease are explained in part by the greater frequency of associated myocardial changes; while there is less frequent opportunity for the action of digitalis on conduction to be manifested, since auricular fibrillation is less common. Hyperpæsis is not a contra-indication, since large therapeutic doses do not increase the blood-pressure in man. In fact, a fall in blood-pressure is sometimes observed, the improved circulation relieving the vasomotor centre of the necessity for maintaining an abnormal degree of general vasoconstriction in order to secure an adequate supply of blood to the brain.

Auricular Fibrillation.—Regarding the action of digitalis in auricular fibrillation, the clinical conception of which irregularity was originated by Cushny and Edmonds, the former writes: "The impulses generated in the fibrillating auricle fall like a shower on the auriculoventricular bundle, which is unable to transmit them all to the ventricle, but allows a certain number to pass at irregular intervals. The pulse is therefore irregular in time and strength." If the pulse-rate is very high, symptoms of cardiac failure appear. Under digitalis the pulse becomes slower, and the rhythm more regular both in time and force, while a parallel improvement in the symptoms occurs. But the auricle does not resume its contractions, and if digitalis is withheld the symptoms of cardiac failure may return. The auriculoventricular block induced by digitalis and its allies in auricular fibrillation is not for the most part an inhibitory effect, for the pulse-rate under atropine is much higher before treatment with digitalis than during its administration. "The more intensive the treatment, and the greater the slowing under digitalis, the less the acceleration under atropine. This may indicate that the slowing in the early stages is in part inhibitory in nature, while as the action deepens, the inhibitory factor becomes less prominent and the direct action more pronounced."

Auricular Flutter.—In flutter the auricular rhythm is regular but very rapid, and the impulses do not arise from the normal pacemaker. The ventricle may respond to each beat, but generally this is prevented by imperfect conduction. Digitalis usually slows the pulse by increasing the block without affecting the auricular rate; but in many cases the auricle passes into fibrillation, which may sometimes be replaced by normal rhythm if the drug is discontinued. Even when the normal rhythm is not restored, the symptoms are often relieved by a slower ventricular rate. The action of digitalis here seems to be inhibitory, for the beneficial effects are removed by atropine.

Heart-block.—Partial auriculoventricular block is generally a contra-indication to digitalis; but when the block is complete the effect on conduction need no longer be feared, and the ventricular contractions may be strengthened by its use. The value of digitalis in this disease is not, however, established.

The presence of extrasystoles or of *pulsus alternans* does not necessarily contra-indicate the use of digitalis. When cardiac failure is not associated with anomalies of rhythm, the value of digitalis treatment varies, and although the results appear to be better in mitral than in aortic disease no general rule can be laid down. Rheumatic cases respond more frequently than others. In extensive myocardial degeneration digitalis often fails. When the cardiac rhythm is normal, improvement in symptoms under digitalis treatment is not necessarily accompanied by slowing of the pulse. Previous slow pulse "does not preclude improvement of the symptoms, and is not a contra-indication

to digitalis." Neither in 'soldier's heart' nor in exophthalmic goitre does digitalis slow the pulse or relieve the symptoms; nor is it of much value in acute cardiac infections. The existence of hypertrophy of the heart is not a contra-indication.

Pneumonia.—"The routine treatment of pneumonia with digitalis is . . . not established as advisable, and the general view is that it should not be given until some special indication is presented. In watching the effects in pneumonia and other fever cases, too much importance must not be laid on the rate of the pulse, for no change may be elicited even though the heart is being affected in strength and in other ways."

UNDESIRABLE SYMPTOMS IN TREATMENT WITH DIGITALIS.—

Extrasystoles.—These may be auricular, but are more often ventricular in origin. "They indicate that the rhythmic capacity of the part of the heart from which they originate is not exhausted by the impulses reaching it." This may result from fewer impulses (action on conduction), or an increased tendency to spontaneous beats (action on heart muscle). Extrasystoles do not contra-indicate further administration of digitalis, unless their frequency is out of proportion to the relief of symptoms by the drug.

Imperfect Conduction and Block.—The block may be either sino-auricular or auriculo-ventricular, and may cause intermissions in the pulse or a regular ventricular response to half of the auricular contractions. It may arise from increased inhibition or from a direct action on the conducting fibres. Digitalis should be withdrawn or the dose reduced.

Pulsus Alternans.—This is of serious significance, since it probably results from some deterioration of the heart muscle. When it begins during digitalis treatment the drug should be abandoned, or used with great care.

ADMINISTRATION.—Digitalis appears to be the most reliable member of the group. The amount needed to produce a definite degree of response has been found less variable than in the case of strophanthus or squill. "The apprehension of the supposed dangers of cumulative action has often reduced (the amount given) to a point at which no effects are obtained in suitable cases. It cannot be stated too strongly that these apprehensions are unfounded, and that the use of digitalis in adequate doses is not liable to cause serious poisoning, and is necessary in order to induce any therapeutic effects." MacKenzie finds that if a drachm of the tincture of digitalis is given per diem, the adequate concentration is reached after 5 to 8 drachms. "But when larger daily doses are given, e.g., 2 drachms, the quantity requisite is smaller". The 'latent' period may be reduced to twelve hours or less by beginning with a single large dose (about half the amount expected to produce a response), and continuing the treatment with a series of smaller doses; a further reduction being made when the desired effect has appeared, and the subsequent dosage being just sufficient to maintain this effect (Eggleston's method). When the symptoms are not urgent the slower method is suitable. In all cases the patient should be under frequent observation. When intensive treatment is employed, a standardized preparation must be given, and the dosage must be more accurate than is generally obtained by ordinary household measurements. The tincture should not be diluted until the time of administration, otherwise loss of potency may occur from decomposition of the glucosides.

Rectal injection has no advantage in preventing nausea due to the drug, unless the stomach is already disordered. Subcutaneous injection is unsuitable, since all the glucosides are local irritants, and would not, in any case, produce more rapid results. Intramuscular injection also causes pain. For emergencies, strophanthin may be injected intravenously; preparations of the other glucosides are too variable for this purpose. Digitalis leaf is sometimes used

orally instead of the tincture, Guy's pill being equivalent to about 15 min. Infusion of digitalis is liable to deterioration. The so-called 'pure principles' (digitalins, digitoxins, etc.) so far obtained from digitalis are not uniform in strength. "Any digitalis preparation that is not cumulative or does not produce nausea is inert, or at any rate so weak that it is valueless."

The tincture of strophanthus, although much more powerful than that of digitalis when given to animals by injection, has not much advantage in this respect when given orally to patients. It seems to be readily destroyed by dilution, and should be dispensed alone. Strophanthin is chiefly of value for intravenous injection in emergency. The dose should not exceed 0.5 mgrm., and must not be repeated within twenty-four hours. The action appears within half an hour, and reaches a maximum in four to six hours. There is no advantage in dividing the dose.

Tincture of squill has an action on the heart similar to, but much less powerful than, that of digitalis.

C. B. Leech² summarizes the effects of digitalis in cases with normal rhythm as follows: (1) Digitalis is useful in many cases presenting regular rhythm, especially if there is congestive circulatory failure. These patients should be digitalized. (2) Eight cases of arteriosclerotic heart disease, with regular rhythm, were digitalized; in six there was clinical improvement. (3) Ten cases of myocardial insufficiency were digitalized; in five cases there was clinical improvement. (4) In six cases of rheumatic heart disease, with regular rhythm, without failure, there was no evidence that digitalization was of benefit. (5) Four cases of rheumatic heart disease, with mitral stenosis with regular rhythm, and congestive circulatory failure, were improved clinically by digitalization. In one case of mitral stenosis digitalis produced a depression of auricular conduction (prolonged P-R interval), coincident with marked clinical improvement. (6) Aortic regurgitation does not contra-indicate the use of digitalis. (7) In a case of complete heart-block, with congestive failure, digitalis produced clinical improvement. In this case the author considers that the digitalis effect was probably a direct action upon the ventricular musculature. (8) In eighteen cases of relative high diastolic blood-pressure there was no evidence of effect from small doses of digitalis. (9) Small doses of digitalis produced no constant or marked change in pulse-pressure, systolic pressure, and heart-rate. There was no evidence that small doses of digitalis were of value in mitral stenosis, angina pectoris, hypertension, and myocardial insufficiency.

N. E. Clarke³ gives a *comparative study of digifolin administration*. Twenty-five patients were treated, most of whom had auricular fibrillation. The dose was 5 ampoules (0.5 grm. of standardized digitalis leaf), given twice daily at 12-hour intervals. The apex-beat was counted every 5 to 10 minutes for 2 hours, then every half-hour for 4 hours, and every hour for the remaining 6 hours. Intravenous, intramuscular, and oral administrations were compared. The earliest maximum slowing was 1 hour with intravenous, 1½ hours with intramuscular, and 2¾ hours with oral. The average and the latest maximum slowing times were in somewhat the same proportions. The comparative efficiency of the different forms of administration, as measured by digifolin requirement, was estimated by taking electrocardiograms twice daily; lowering or inversion of the T wave was taken as evidence of activity, and the time and dosage for this to occur was noted. Again, intravenous was about a third more efficient than intramuscular, and about twice as efficient as oral. Some danger was observed in giving a big dose of digifolin intravenously or intramuscularly, as two of the patients died apparently affected by the drug. The average time of slowing was: intravenous, between 3 and 4 hours; intramuscular, 4 hours; oral, 6 hours.

Camphor in Oil.—H. M. Marvin and J. D. Soifer¹ say that many divergent views are held by numerous writers on the use of camphor in heart cases. Clinicians usually regard it as a cardiac stimulant *par excellence*. Pharmacologists think it has no effect even in large doses, except to cause a slight dilatation of the vessels of the skin. The authors tried to prove its value by taking fourteen cardiac patients, all of whom showed advanced evidence of decompensation. Some had fibrillation, others had normal rhythm. Two patients each received 3 injections of camphor, 8 each received 4 injections, 2 each received 5 doses. The injections were intramuscular, and the dose varied from 0.2 grm. to 0.3 grm. There was no change in 10 of the patients; the remaining 4 were definitely more uncomfortable. Subsequently 12 of the 14 received digitalis, and 10 of these showed prompt and definite improvement.

Adrenalin.—In severe toxic circulatory weakness, where other remedies fail, Haeberlin² states that many a life can be saved by treatment with subcutaneous adrenalin injections continued for several days. They should be given at intervals of from one to two hours, 0.1 to 0.2 c.c. of a 1-1000 solution. Great stress is laid on the need for completely rubbing the injected fluid into the tissues so as to get as quick and entire absorption as possible.

Exercise.—The question as to the amount of exercise and work a cardiac patient is fit for has always to be carefully considered in each individual case. People with apparently normal hearts show great differences in their response to exercise, due often to associated constitutional or acquired defects. Thus we find that O. Bruns,³ writing on changes in the size of the heart following physical exertion, especially in sports, states that sports of endurance and skill cause no great increase in the size of the heart. He considers that acute or chronic dilatation in otherwise normal hearts may be caused by: (1) Constitutional anomalies such as lymphatism, asthma, etc.; (2) The combination of physical exertion with over-feeding and alcohol; (3) Physical over-exertion by too strenuous training and record breaking. He points out the dangers of excessive exercise.

Carey Coombs⁴ thinks that lack of exercise may have something to do with the increased incidence of cardiac and arterial degenerations. He advocates exercise as a curative agent, starting with massage and passive exercises in bed cases.

G. H. Hunt⁵ divides his treatment into three stages: massage, passive movements, and active movements. The stage at which exercise may be started and the kind of exercise employed depend on the presence of (1) acute carditis, (2) chronic cardiac insufficiency, (3) effort syndrome. In acute carditis and cases of severe cardiac insufficiency the exercises are carried out in bed to start with. In effort syndrome cases, the exercises are of a more strenuous character than in the other two.

Diathermy.—C. Lian and P. Descoust⁶ consider that diathermy is capable of producing considerable improvement and deserves to take the first place in the treatment of *intermittent claudication*. Diathermy has no action on the arterial obliteration itself; its action is not felt upon the great arteries, but upon the little blood-vessels and capillaries. It causes a local and general heating up of the organism, and an intense vasodilatation which favours the arrival of the flow of blood in the arterial channels of supply. It acts against the often concomitant spasms, and stimulates the metabolism and improves the nutrition of the tissues. It is of the first importance to apply early treatment before the circulation is altogether too uncertain. The applications of diathermy should be at first weekly, then every three weeks; each treatment should last from thirty to forty minutes, in successive series of about twenty every three months. The intensity should not be more than 1500 ma. The

localization of the obliteration of the blood-vessel indicates the regions where the plaques should be applied; but one must nevertheless be careful to go beyond especially the upper limit of the obliteration.

REFERENCES.—¹*The Action and Uses in Medicine of Digitalis and its Allies*, 1925, Longmans, Green & Co.; ²*Boston. Med. and Surg. Jour.* 1923, Feb. 26, 392; ³*Amer. Jour. Med. Sci.* 1924, Aug., 201; ⁴*Jour. Amer. Med. Assoc.* 1924, July 12, 94; ⁵*Munch. med. Woch.* 1925, May 1; ⁶*Ibid.* April 17, 623; ⁷*Clin. Journal*, 1925, June 3, 256; ⁸*Guy's Hosp. Rep.* 1925, Jan., 20; ⁹*Presse méd.* 1924, Oct. 22, 833.

HEART DISEASE, PROGNOSIS IN.

J. E. MacIkwaine, M.D.

S. B. Boyd Campbell, M.D.

Life Expectancy with Aortic Regurgitation.—F. A. Willius and J. Fitzpatrick¹ report on 463 cases of aortic regurgitation, of which 296, or 64 per cent, were non-syphilitic, while 167, or 36 per cent, were syphilitic. The age-incidence of non-syphilitic cases of aortic regurgitation was highest in the third and fourth decades of life, in which 83 and 75 cases respectively were recorded. In syphilitic cases the highest incidence was in the fourth decade—74 cases. As regards sex-incidence, the non-syphilitic group showed 242 males (82 per cent) and 54 females (18 per cent). A similar ratio occurred in the syphilitic group—142 males (85 per cent) and 25 females (15 per cent). The cardiac mortality in the non-syphilitic group was 39 per cent, and in the syphilitic group 46 per cent. Figures are given which show the relative cardiac mortality with the various electrocardiographic changes. These indicate what the writers have already pointed out, i.e., the graver prognosis associated with a negative T wave, aberrant QRS complexes, etc. (see ELECTROCARDIOGRAPHY).

Vital Capacity as a Functional Test in Heart Disease.—Thomas Ziskin² studied 207 cardiac patients at the U.S. Veterans' Bureau Clinic, and considers that vital capacity is of no value in cardiac disease, and that there is no definite relationship between vital capacity and cardiac efficiency in ambulant cardiac patients, or between vital capacity and type of cardiac lesion.

Heart and Aorta Strain and 'Lying-down' Heart.—E. M. Brockbank³ discusses these conditions, and his conclusions are as follows: (1) A strain of the healthy heart has never been seen by him. (2) High blood-pressure is the commonest cause of heart strain, and is often associated with angina; the onset may be gradual or sudden. (3) People with aortic regurgitation are more liable to strain. (4) The 'lying-down' heart, where the nerve of the heart is in contact with the diaphragm, is often apt to cause symptoms, etc., after slight strain. (5) Syphilis is an important factor in cases of strain.

REFERENCES.—¹*Med. Jour. and Record*, 1924, Nov. 5, 417; ²*Arch. of Internal Med.* 1925, Feb., 259; ³*Brit. Med. Jour.* 1925, i, 57.

HEART DISEASE, RHEUMATIC.

J. E. MacIkwaine, M.D.

(See also RHEUMATISM.)

S. B. Boyd Campbell, M.D.

In his monograph upon rheumatic heart disease, Carey Coombs¹ brings before us very definitely the real issue in the study of all heart diseases. He points out that the problem of cardiovascular disease, its prevention and cure, is in the end the question of a specific infection. Thus, to quote an abbreviated passage: "What I have tried to argue is that no one has any business to think that cardiac diagnosis ends with one of the conventional labels 'pericarditis', 'aortic regurgitation', 'mitral stenosis', and so on; . . . aortic regurgitation is no more a true diagnosis than 'diarrhoea' is of a case of dysentery. What must be done is to find out whether the valve lesion is rheumatic or syphilitic or due to progressive ulceration. . . . Let us develop the habit of thinking, even if it is not actually uttered, of 'cardiac rheumatism', 'cardiac syphilis', and so forth, just as we think of 'pulmonary tuberculosis', 'pneumococcal arthritis', etc.". Whether there is a definite *Streptococcus rheumaticus* is not

taken to be definitely decided, but the author apparently inclines to its acceptance as the specific virus.

The chapter upon the morbid anatomy and histology is illustrated copiously by plates showing the formation of the 'submiliary nodule', which has been so clearly demonstrated as the primary phase of acute infection by the writer, Aschoff, and others (*Plates XXIV-XXVI*). The description of the transition from this primary lesion into its final fibrotic state is demonstrated also by numerous illustrations, and the indiscriminate distribution of these nodules in the pericardium and myocardium and endocardium is emphasized.

The chapter on prognosis closes with a paragraph pointing out the unexpected vitality of many cardio-rheumatics, and allows us to remember that auricular fibrillation may persist through an attack of acute lobar pneumonia, and that valvular disease of the heart, even of an aortic type, is not inconsistent with a life of three score years and ten.

Comparison of Rheumatic Disease of the Heart and Bacterial Endocarditis.—W. S. Thayer² records that in 35 years there were 25 post-mortems on cases of pure rheumatic origin, and, wishing to compare these cases with bacterial endocarditides, he gives a short analysis of the former. *Age*: From 6 years to 47, 76 per cent in the first two decades, 88 per cent in the first three. Rheumatic fever is a disease of childhood and youth. *Sex*: 17 males and 8 females. *Pre-existing valvular disease*, 64 per cent. *Portal of entry of the infectious agent unknown*, but 68 per cent of the patients had infected tonsils or adenoids, and 25 had peridental infection. *Arthritis*, 72 per cent; all except one child had had arthritis at some time. *Mode of onset*: Where there was no polyarthritis, the disease was one of the heart with chorea or an atypical arthritis. Fever was continuous in 75 per cent, in 25 per cent irregularly intermittent. *Chills and chilly sensations* were only complained of in one case, a sharp contrast to bacterial endocarditis. *Petechiæ* were not seen in any case, *splenic enlargement* only once; *embolic phenomena* were not recognized clinically; *cerebral embolism* was not observed. *Club fingers* occurred in two cases associated with chronic valvular disease. *Acute nephritis* was only seen in one case, a marked contrast to bacterial endocarditis; red cells were only found once in the urine. The blood showed a secondary anæmia with a leucocytosis—a neutrophil polymorpholeucocytosis. Death occurred from myocardial insufficiency; the duration was from two weeks to several months. Acute pericarditis occurred in 67 per cent, chronic pericarditis in every case but one, justifying the term 'endo-pericarditic'. Of the 24 cases, 21 showed characteristic Aschoff bodies. Chronic fibroid myocarditis was found in 58 per cent; some myocardial change was found in every case examined. Of the lesions, 58 per cent were in the left heart, in the mitral valve 88 per cent, aortic valve 80 per cent, tricuspid valve 44 per cent. *Mural endocarditis*, apparently chronic, occurred in 5 cases, acute mural endocarditis in 20 per cent, and in 20 per cent chronic effects were seen in the left auricle. Meningitis occurred once, focal suppuration once. *Bacteriologically blood culture was negative in every case*. The one characteristic lesion is the perivascular Aschoff bodies. It is noted that the electrocardiographic changes may indicate early an involvement of the heart muscle.

Lesions of the Aorta associated with Acute Rheumatic Fever, and with Chronic Cardiac Disease of Rheumatic Origin.—A. M. Pappenheimer and W. C. von Glahn³ describe a comparative histological study of the aorta made in a series of 76 rheumatic cases and in 77 non-rheumatic cases, death resulting from a variety of diseases. An equally large series of syphilitic aortitis cases was studied for comparison. Certain lesions were found in a much higher percentage of the rheumatic cases than in the controls, and, so far as these

PLATE XXIV.

RHEUMATIC HEART DISEASE

(JAREY COONTS)

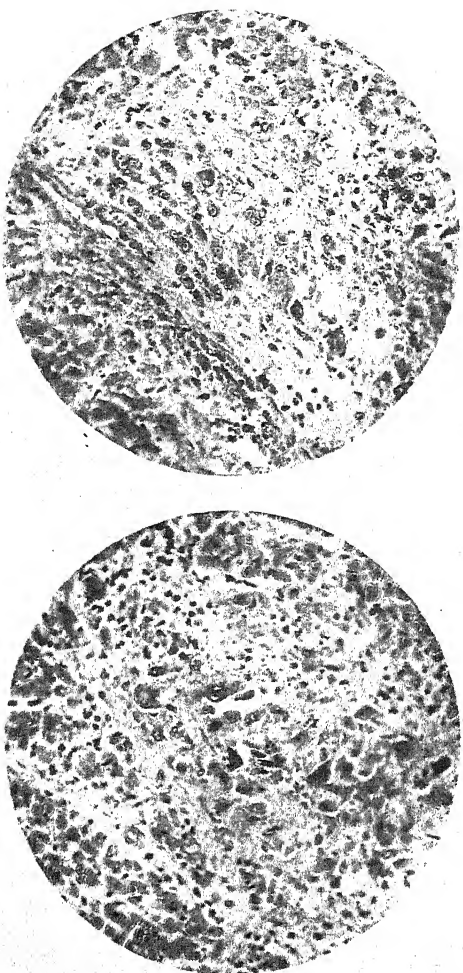


Fig. A.—Showing subsidiary nodules from myocardium in rheumatic carditis. The *left* figure shows clearly the characteristic large cells containing one or more translucent nuclei; in one of these cells five or six nuclei may be observed. Note the absence of polymorphous leucocytes. The *right* figure shows similar cells taking origin from the endothelium of small blood-vessels, which are seen in transverse section in the middle of the field. The background has a fibrous structure.

Plates XXIV-XXVI from Photomicrographs by Dr. Geoffrey Haddad

PLATE XXV.

RHEUMATIC HEART DISEASE—*continued*



Fig. B.—Mitral valve (high power); shows vascularization of the valve to a point not far from its free margin; and an inflammatory reaction very similar to that seen in the figure below (the subcutaneous node).

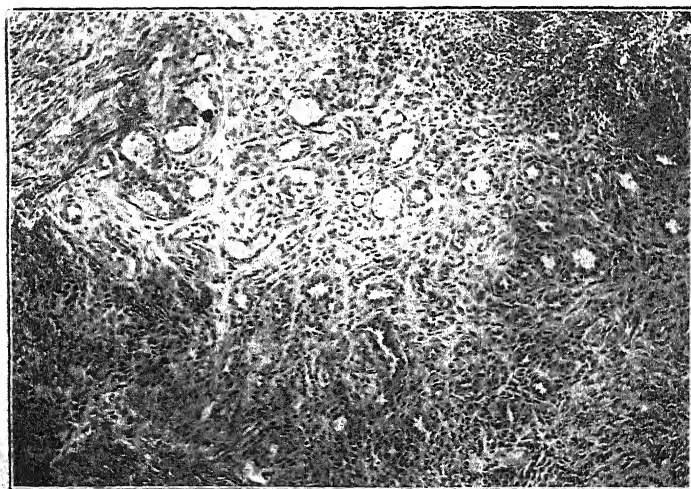


Fig. C.—Subcutaneous node.

There is an exuberant reaction, richly productive of fibrous tissue.

PLATE XXVI.

RHEUMATIC HEART DISEASE—concluded

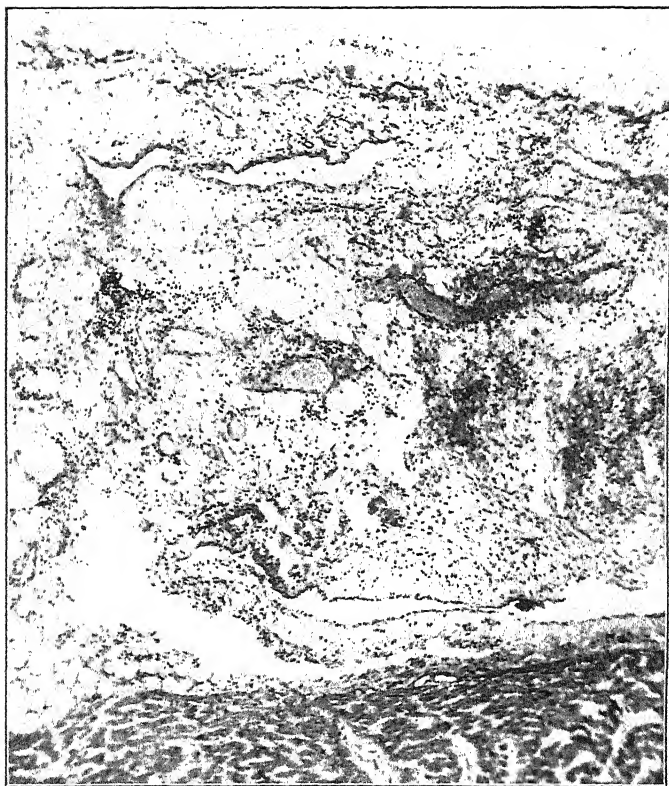
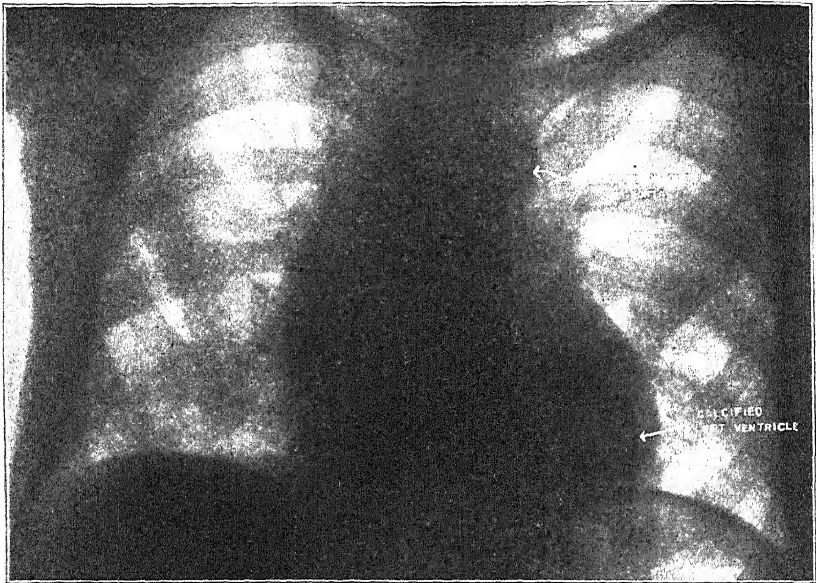


Fig. D.—Acute pericarditis in an early phase (low power). There are perivascular areas of fibrinous deposit and cellular infiltration similar to the submiliary nodule in an early phase.

PLATE XXVII.

X RAYS AND CARDIAC DIAGNOSIS



Postero-anterior skiagram of the chest of Scholz's patient, taken intra vitam, showing the ring-like shadow within the apical portion of the heart, and the oval-shaped shadow within the bulbus aortæ.

By kind permission of the 'Archives of Internal Medicine'

observations go, appear to be characteristic of rheumatic infection. The most distinctive lesions were: (1) Dense scars in the vicinity of the nutrient vessels, often acellular; (2) Aschoff cells or nodules in the adventitia.

The Incidence of Rheumatic Fever, Chorea, and Rheumatic Heart Disease.—J. M. Faulkner and P. D. White⁴ find that the incidence of rheumatic fever and chorea varies with climate and time of year. It has a greater incidence in wet climates, and in these climates it has a higher incidence in late winter and early spring. Statistics are quoted from various hospitals all over the world, and comparisons are given, such as Johannesburg 5·8 per cent, Glasgow 4·7 per cent, Los Angeles 0·4 per cent, and San Francisco 3·8 per cent, of medical cases admitted to the various hospitals. As proof of the tendency for rheumatic conditions to run in families, they give a series of 200 families with children with rheumatic diseases, and found that 71 families, or 35·5 per cent, had two or more individuals affected; 8·79 per cent of 1235 exposed persons were infected. They ascribe the increased liability of members of rheumatic families to rheumatic infection to: (1) Hereditary predisposition; (2) Environmental conditions, especially cold, dampness, and poor hygiene; (3) Direct infection.

Mitral Stenosis without Rheumatic Fever in North China.—H. E. Meleney and I. Kellers⁵ state that in North China typical rheumatic fever is almost unknown. Mitral stenosis, however, is the common heart lesion, and its incidence is comparable to that in Western countries. Thus, in 2694 medical patients there were 39 cases of mitral stenosis, or 1·45 per cent. Of these 2694 cases, only 12 showed arthritis or rheumatic fever, i.e. 0·4 per cent. Of these 39 cases of mitral stenosis, 4 gave no record of joint pains, only 1 gave a positive history of rheumatic fever, 1 a history of chorea, while 14 gave a history of joint pains of varying intensity. 62·7 per cent were females, while 37·3 per cent were males. No other infectious disease appears to be specially involved in these cases of mitral stenosis. In sex- and age-incidence, in electrocardiographic phenomena, and in the pathology of three cases that came to post-mortem, these cases are similar to those of mitral stenosis seen in Europe and America.

Results of Surgical Interference.—H. L. Heimann⁶ submits that removal of tonsils, adenoids, and other septic foci in cases of rheumatic heart disease leads to a great improvement in both the general and the cardiac condition of the patients. In some cases murmurs which were considered organic cleared up. Foci of infection can infect the heart (1) functionally, (2) organically, and both of these can be improved by removal of foci.

Medico-social Aspects of Heart Disease.—Bess Russell⁷ points out that by far the most important measure to wipe out heart disease is to endeavour to accomplish its prevention—rheumatic fever, chorea, and syphilis being the most important lines of attack, while thyroid disease is also of importance. The necessity for research such as the Rockefeller Foundation is undertaking, the development of clinics, the clinical follow-up and suitable convalescence, with the long-continued rest and care of the patient, is pointed out. The educational and individual consideration of the patient with regard to industry and its calibre should be attended to. It is advised that a closer co-operation between those undertaking the care of cardiac patients and industry should be sought—this from the point of view of insurance compensation, etc. Finally, it is indicated that an extensive educational propaganda is necessary to arouse public opinion to realization of the seriousness of the cardiac problem, and to make clear the technique of combating heart disease.

REFERENCES.—¹*Rheumatic Heart Disease*, John Wright and Sons Ltd., Bristol; ²*Johns Hop. Hosp. Bull.* 1925, Feb., 99; ³*Jour. Amer. Med. Assoc.* 1924, Dec. 6, 1873; ⁴*Ibid.* Aug. 9, 425; ⁵*Arch. of Internal Med.* 1924, Oct., 455; ⁶*S. Afric. Med. Record*, 1925, Jan. 24, 26; ⁷*Boston Med. and Surg. Jour.* 1924, Sept. 25, 573, Oct. 2, 624, and Oct. 9, 670.

Joseph Priestley, B.A., M.D., D.P.H.

Rheumatic Heart Disease and the Public Health.—Of all deaths registered yearly in England and Wales, 12 per cent were certified as due to diseases of the heart itself (excluding diseases of blood-vessels), and, of this 12 per cent, 60 per cent was due to rheumatic fever. From 50,000 to 60,000 children of school age are suffering from organic heart disease, and probably about double that number from functional heart disease. Such figures are more than sufficient to justify very careful investigations, especially amongst school children. Rheumatism must be attacked, and rheumatism in childhood is not to be diagnosed by joint pains and swellings in the joints as is the case in adult rheumatism, but by febriculae and changes in the heart (with tendencies to relapses). Scarlet fever may run concurrently and be blamed for the attack of rheumatism and subsequent heart disease (that follows from the rheumatism and not from the scarlet fever). Chorea, too, is a concomitant disease occasionally, being probably a rheumatic infection of the central nervous system, whilst diseased and inflamed and enlarged tonsils and oral sepsis are often noticed as preceding attacks of rheumatism, suggesting the mouth and nose as the points of attack of the rheumatic bacillus. Poverty and bad housing conditions predispose to attacks of rheumatic fever, due to want of fresh air and sunshine, sufficient nourishment, and suitable clothing. Geographical distribution of the disease is a factor in predisposition.

HEART, EXAMINATION OF.

J. E. MacIkwaine, M.D.

S. B. Boyd Campbell, M.D.

CARDIAC SOUNDS AND MURMURS.

The Interpretation of Systolic Cardiac Murmurs.—W. S. Thayer¹ concludes an article on this subject with the following summary, which especially emphasizes several simple points: (1) That it is not the frequency of soft systolic murmurs at aortic and pulmonary orifices that is remarkable. What is remarkable is that they are not always present. (2) That the presence of such murmurs depends upon the relative stenosis represented by the more or less rigid aortic or pulmonary ring and the dilatability or dilatation of the vessel beyond. The frequency of such murmurs at the aortic orifice in later life is, in the majority of instances, dependent upon a greater or less dilatation of the arch, not upon roughnesses at the aortic ring. (3) The frequency of functional systolic apical murmurs in the young when in the recumbent posture. (4) The importance of recognizing cardiorespiratory murmurs, and the realization that they are often heard with considerable intensity in the back.

Phenomena Counterfeiting Heart Disease.—Carey Coombs² discusses this question, and describes fully the various murmurs which may mislead. The cardio-respiratory murmur of common occurrence and no serious import is described, and its areas of audibility are shown diagrammatically (Fig. 25).

X RAYS AND CARDIAC DIAGNOSIS.

Calcification of the Heart, and its Röntgenological Demonstration.—T. Scholz³ reviews 30 cases of this condition in the literature, starting with Morgagni's case published in 1762, and adds a case of his own. Röntgenological literature on calcification of the heart and its demonstration *intra vitam* (Plate XXVII) is extremely scanty. There are only five previous instances on record in which Röntgen-ray diagnosis of calcification in the heart was made during life. In none of these was a confirmatory post-mortem examination made. Scholz claims that his is the first case diagnosed Röntgenographically *intra vitam* which was confirmed by necropsy. He also strongly advocates the use of Röntgen rays in necropsy specimens to demonstrate calcified areas.

X Rays in Pericarditis.—G. W. Holmes⁴ offers some observations on the use of Röntgen rays in the diagnosis of pericarditis, from tests both experimental and clinical. Experimental tests consisted of studies made on fresh hearts suspended in media of varying specific gravity, the lightest being air and the heaviest being salt solution with sp. gr. 1036. The heart was visible as a shadow of increasing density until the specific gravity reached 1000, at which time it disappeared, and again became visible as a shadow of diminishing density when the specific gravity reached 1036. The shadow of the heart itself was not visible when the density of the medium corresponded to that of the pericardial effusion. The second group of experiments consisted in injecting the pericardium of the cadaver. This confirmed the view that the earliest changes in the shape of the heart are seen in the region of the sinus at

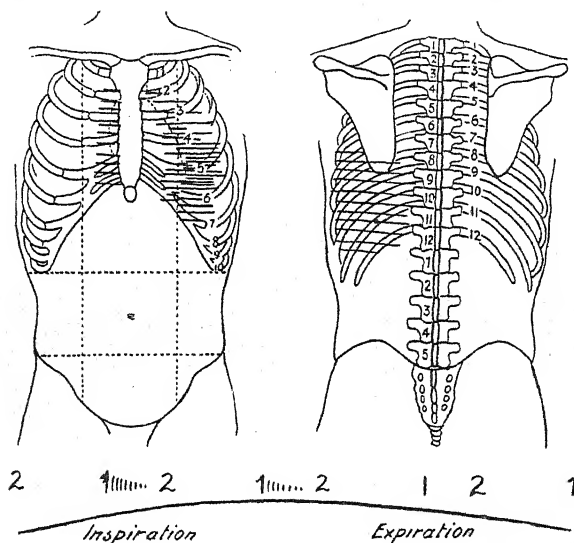


Fig. 25.—Characters of a cardio-respiratory murmur.
(Re-drawn from the 'Lancet'.)

the base of the heart and along the posterior border. Clinical data showed that X-ray findings in order of importance in pericardial effusions are: (1) Enlargement of the heart shadow, with tendency to assume the triangular or water-bottle shape. (2) Abnormal shape of heart shadow. (3) Change of shape with change of position. (4) Obliteration of the normal outline of the various chambers of the heart. (5) Changes in the shape of the angle formed by the posterior border of the heart, the diaphragm, and the spine: more likely to occur in pericarditis with adhesions than with fluid. (6) Faint or absent pulsation. In the last four years 2950 patients were examined, and of these, 36 showed disease of the pericardium by Röntgen ray; 21 of these were confirmed clinically.

ELECTROCARDIOGRAPHY.

The Human Dying Heart.—M. H. Kahn and I. Goldstein⁵ report 7 electrocardiographic studies of the dying heart. Three of these died from heart disease, and the other cases from other causes. One case had marked auricular

fibrillation. The first and main effect in all was failure of sinus control, with assumption of control by the *a-v* node. They wish to call attention to the early auricular phenomena which occur while recovery is still possible, as compared with those which occur later in the ventricle. They believe these earlier disturbances of auricular action are most important, since intracardiac injections of adrenalin and other stimulants may be of life-saving value, and it has not yet been ascertained in what process of the heart their value may prove greatest.

The Effects of Mitral Stenosis, Pulmonic Stenosis, Aortic Regurgitation, and Hypertension on the Electrocardiogram.—Summarizing these effects, P. D. White and C. S. Burwell⁶ state that it is evident that there is a definite relationship between abnormal right axis deviation by electrocardiogram and mitral stenosis and pulmonic stenosis, and between abnormal left axis deviation and aortic regurgitation and hypertension. Also the auricular complex of the electrocardiogram in Lead I, Lead II, or both, is almost always abnormally prominent in cases of pulmonary stenosis and of mitral stenosis.

The Electrocardiogram as an Aid in the Diagnosis of Adhesive Pericardial Mediastinitis.—F. R. Dieuaide⁷ has used the change in the QRS group of the electrocardiogram, which occurs with the change of the electric axis of the heart, to demonstrate the presence of adherent pericardial mediastinitis, and summarizes his article thus: (1) Normally there is a change in the form and amplitude of the electrocardiographic waves on shifting the subject from the right to the left side. This phenomenon is marked in most patients with heart disease. It is due to rotation of the heart. (2) It is shown that cardiac enlargement does not prevent the usual change. (3) Clinically, we may only hope to diagnose instances of 'adherent pericardium' in which both the pericardial cavity and the mediastinum are involved by adhesions. (4) A small series of patients is reported who showed no significant change in their electrocardiographic record with a shift in position. All of these who came to necropsy were found to have important lesions involving both the pericardium and the mediastinum. Of a larger series of patients with clinical signs of 'adherent pericardium', whose records showed a marked change, none were found to have lesions both of the pericardium and of the mediastinum. (5) It is suggested that fixation of the electrical axis, determined by this means, may serve as objective evidence of this lesion.

Abnormal Electrocardiograms in Heart Disease, with special reference to the Coronary T Wave.—A peculiar form of the T wave of the electrocardiogram is described by H. E. B. Pardee,⁸ writing on heart disease and abnormal electrocardiograms; it is shown in Fig. 26. The electrocardiogram and certain clinical features of 150 patients were reviewed, the clinical diagnosis being equally divided between coronary disease, chronic fibrous myocarditis, and cardiac valvular disease; 82 per cent of the myocardial group, 68 per cent of the coronary group, and 26 per cent of the valvular group showed one or more of the significant abnormalities of the ventricular waves. The degree of cardiac failure at the time of the record did not coincide with any special frequency of normal or abnormal waves. The diagnosis of cardiac infarction was associated with a high frequency of abnormal ventricular waves, 81 per cent. Definite cardiac enlargement was associated with a greater frequency of abnormal waves in both the myocardial and valvular groups, but not the coronary group. These findings are in agreement with the opinion that the electrocardiographic abnormalities are due to disease of the ventricular muscle.

The special peculiarity of the T wave was only found in patients of the coronary group, and only in one-third of these. Another third showed other abnormalities of the ventricular waves, and the remaining third had normal

waves. The cause of this coronary T wave is considered to be the secondary reaction of repair about an area of deficient blood-supply in the ventricular muscle. The situation of this area is of importance, for if the branches of the auriculoventricular bundle are much involved, other abnormalities of the curve will arise and may mask the special peculiarity of the T wave. The significance of this special T wave is discussed, and it is concluded that it only arises from coronary artery disease with narrowing of the lumen of a large branch, but that any other abnormality of the electrocardiogram may result from the same cause. If normal waves are found in a patient suspected of coronary disease, we may feel that the arterial changes are not of a marked degree.

The Electrocardiogram in Uremia and Severe Chronic Nephritis with Nitrogen Retention.—J. E. Wood, Jnr., and P. D. White⁹ have made a detailed study of 38 cases of uræmia with nitrogen retention, with the special idea of observing toxic effects on heart muscle as shown by the electrocardiogram. With the exception of diphtheria no endogenous toxin has definitely been proved to alter the electrocardiogram. All the cases had a non-protein nitrogen of 69 mgrm. or over per 100 c.c. of blood. Twelve cases showed abnormal electrocardiograms. They conclude: "In certain cases of uræmia and severe nephritis with an increased blood nitrogen there is a toxic effect acting in some respects like digitalis on the heart muscle. It may produce abnormal electrocardiograms; changes in the T wave of Lead II, less often abnormal rhythm, and rarely an increase in the auriculoventricular conduction interval or in the duration of the QRS complex."

Life Expectancy with Aortic Regurgitation, in relation to Electrocardiography.—In their work on life expectancy with aortic regurgitation, F. A. Willius and J. Fitzpatrick¹⁰ compare the cardiac mortality with the T wave negative in various derivations. Thus:—

1. Cardiac mortality with T wave negative in Derivation I: (a) Non-syphilitic aortic regurgitation, 76 per cent; (b) Syphilitic aortic regurgitation, 87 per cent.

2. Cardiac mortality with T wave negative in Derivations I and II: (a) Non-syphilitic aortic regurgitation, 67 per cent; (b) Syphilitic aortic regurgitation, 68 per cent.

3. Cardiac mortality with T wave negative in Derivations II and III: (a)

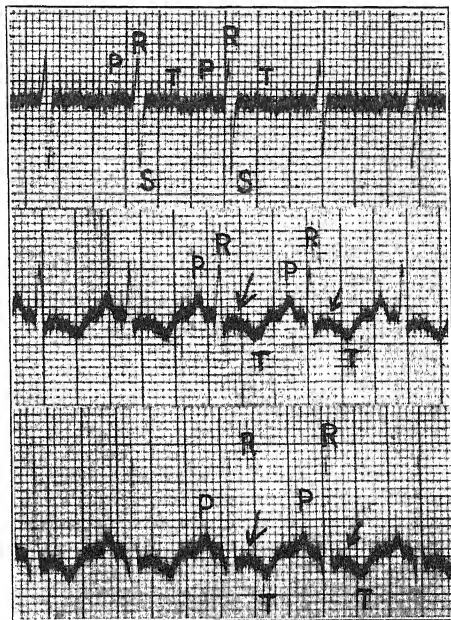


Fig. 26.—Abnormal electrocardiogram in heart disease: record of a case proved by autopsy. The characteristic upward convexity of the R-T interval is seen in Leads II and III. (By kind permission of the 'American Journal of the Medical Sciences'.)

Non-syphilitic aortic regurgitation, 44 per cent; (b) Syphilitic aortic regurgitation, 64 per cent.

4. Cardiac mortality with T wave negative in Derivations I, II, and III: (a) Non-syphilitic aortic regurgitation, 40 per cent; (b) Syphilitic aortic regurgitation, 88 per cent.

5. Cardiac mortality with composite T wave negative: (a) Non-syphilitic aortic regurgitation, 36 per cent; (b) Syphilitic aortic regurgitation, 76 per cent.

6. Cardiac mortality with aberrant QRS complexes in all derivations: (a) Non-syphilitic aortic regurgitation, 86 per cent; (b) Syphilitic aortic regurgitation, 1 case—the patient died from heart disease.

7. Cardiac mortality with auricular fibrillation: (a) Non-syphilitic aortic regurgitation, 50 per cent; (b) Syphilitic aortic regurgitation, 2 cases—both died from cardiac disease.

8. Cardiac mortality with delayed *a-v* conduction: (a) Non-syphilitic aortic regurgitation, 69 per cent; (b) Syphilitic aortic regurgitation, 3 cases—2 were traced; 1 had died from heart disease, 1 was worse.

9. Cardiac mortality in cases in which the foregoing graphic abnormalities were absent: (a) Non-syphilitic aortic regurgitation, 24 per cent; (b) Syphilitic aortic regurgitation, 32 per cent.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1925, March, 313; ²*Lancet*, 1924, ii, 1323; ³*Arch. of Internal Med.* 1924, July, 32; ⁴*Jour. Amer. Med. Assoc.* 1924, Nov. 29, 1745; ⁵*Amer. Jour. Med. Sci.* 1924, Sept., 388; ⁶*Arch. of Internal Med.* 1924, Oct., 529; ⁷*Ibid.* 1925, March, 362; ⁸*Amer. Jour. Med. Sci.* 1925, Feb., 270; ⁹*Ibid.* Jan., 76; ¹⁰*Med. Jour. and Record*, 1924, Nov. 5, 417.

HEART FAILURE.

J. E. MacIckaine, M.D.

S. B. Boyd Campbell, M.D.

In two articles in *La Presse Médicale*, C. Laubry, D. Routier, R. Largeau, and P. Oury^{1,2} present a statement of views in regard to the necessity of distinguishing a cardiac insufficiency which has for its basis the right ventricle, and a pure left ventricular insufficiency.

Right Ventricular Insufficiency.—

Local Signs.—The authors note the following points: (1) Tachycardia, which is never absent, and usually above 90 or 120; digitalis has no effect on this rhythm. (2) Dilatation of the right ventricle; visible pulsation in the epigastric region. This is confirmed by percussion and radiocopy. (3) *Bruit de galop droit*. This is heard at the costo-xiphoid angle. A tracing by Bouton de Larey in this costo-xiphoid angle gives a record similar to a normal regular jugular tracing, with *a*, *c*, and *v* waves. (4) A pulmonary diastolic murmur very rarely occurs, but is of great import. (5) On the other hand, a tricuspid systolic regurgitant murmur is very unusual. They think the systolic murmur in this area is usually mitral. (6) The electrocardiogram is inconstant. (7) The radioscopic picture they consider characteristic, and believe it is best seen by a transverse position 85° left.

Functional and Peripheral Signs.—In the first place dyspnoea is pronounced, beginning in attacks, then becomes continuous under effort, with very marked increasing cyanosis. Cyanosis is of course marked, and sometimes a polycythæmia is present.

Evolution.—The evolution of right ventricular insufficiency is dominated by its rapidity and its fatal issue. Its evolution is not years but months in duration. Little influence is observed from the use of cardiac tonics. Death usually follows from a dyspnoic crisis, without on some occasions peripheral oedema.

Causes of Insufficiency of the Right Ventricle: (1) Congenital heart disease. (2) Pulmonic affections—pneumonia, emphysema, chronic bronchitis, etc.

Here the importance of a right gallop rhythm, sclerosis of the pulmonary artery, mediastinal pressure, and pleuro-pericarditis are also discussed. (3) Aneurysm of the large vessels at the base. (4) Arteriovenous aneurysms. (5) Lesions of the right heart. In this context it is pointed out that the mitral failure is associated with an insufficiency of the left ventricle, and not with an asystolic state on the right side.

Summarizing their views, these authors think it is of great practical importance to be able to diagnose a right ventricular insufficiency on account of its fatal prognostic significance, together with the uselessness of exhibition of cardiac tonics.

Left Ventricular Insufficiency.—

Functional Symptoms.—These are different in different patients, but fall into two groups: (a) Dyspnoæic manifestations; and (b) Pain, manifested in precordial region. The evolution of the dyspnoea and pain may be gradual, or may occur in paroxysms—i.e., attacks of cardiac asthma or angina pectoris.

Physical Signs.—These may be considered as (a) local cardiac signs, and (b) vascular signs.

The cardiac signs are three—the *bruit de galop*, the functional mitral regurgitant murmur, and the functional murmur of aortic insufficiency. The *bruit de galop*, which is best heard over the left ventricle, is always associated with a muffled quality of the first sound. The electrocardiogram is inconstant. Sometimes the P-R interval is prolonged. Some authors associate the *bruit de galop* with a right or left bundle lesion, an opening of the R interval, notching of the R, or inversion of the P wave. Modifications of rhythm occur—those above mentioned, tachycardia and bradycardia, left ventricular extrasystoles, and *pulsus alternans*.

The vascular signs show a variable arterial tension, with sometimes diminished pulse-pressure, and, when the diastolic rises, insufficiency is indicated. Various hæmorrhages occur.

The radioscopic findings are emphasized, and are considered a very important adjunct in cardiovascular diagnosis.

Evolutionary Phenomena.—The evolution of ventricular insufficiency is characterized by an ensemble of visceral and peripheral symptoms in part due to arterial slowing of circulation and in part to venous stasis. The classical view of a venous stasis and right ventricular insufficiency is not properly a true right ventricular failure. As already pointed out, true right ventricular insufficiency presents definite clinical signs. Many cases of total cardiac insufficiency occur where the right ventricle has not failed. Evidence of left ventricular failure is seen in:—

1. The cardiac lung: There is fine subcrepitus at the bases, especially the left. This is not a passive congestion; it is a true œdema, occasionally hæmorrhagic. The 'infarct' found is a thrombosis or a local apoplexy. A pleural exudate may exist on one or both sides, often consecutive to an infarct; once established, it gives rise to an exhaustible effusion. Chronic emphysema may be associated with this left failure and hide it.

2. The cardiac liver: This occurs early, like the cardiac lung. It is large and tender. Occasionally slight jaundice, etc., is present.

3. The cardiac kidney: Diminished urine, chlorides diminished, urea retention.

4. The cardiac brain: Insomnia is fairly constant; more rarely Cheyne-Stokes respiration. Morphia advised.

5. Digestive system: This system suffers the least, and disorders are often due to errors in dieting. Eructations of gas occur, and precordial pains with gastric distention.

6. Peripheral œdema : Begins in legs, spreading to genitals and abdomen, the opposite of the evolution of œdema in right ventricular insufficiency.

Etiological Forms of Left Ventricular Insufficiency.—(1) Aortitis. (2) Hypertension. (3) Endocarditis and valvular lesions. Mitral stenosis is the only left-sided lesion which gives rise to right heart insufficiency. In the chronic valvular failure the authors mention that the Flint murmur is in reality a gallop. They say the left ventricular insufficiency is dependent upon infection, endocarditic in type, and that no death occurs without this inflammatory process. Subacute endocarditis is, in their view, the determining factor in cardiac insufficiency, and is in this way comparable to rheumatic fever. They mention how it determines the end in congenital aortic lesions. (4) Myocarditis, both acute and chronic fibroid myocarditis. (5) 'Myocardie', a gradual development of left ventricular failure in people of about fifty without any hypertension, etc., like the hyperthyroid heart, probably endocrine in origin.

The Myocardium in Non-infectious Myocardial Failure.—B. J. Clawson,³ discussing this question, reports on a series of 102 cases, divided into 8 groups, as follows : (1) Cases of hyperpiesia that died of myocardial failure, 37 cases. (2) Cases of hyperpiesia with slight cardiac decompensation that died of cerebral hæmorrhage, 7 cases. (3) Cases of myocardial failure with right ventricular hypertrophy and dilatation resulting from increased intrapulmonary resistance, 4 cases. (4) Cases of glomerular nephritis with cardiac decompensation, 3 cases. (5) Cases of sudden death associated with coronary sclerosis without previous symptoms of cardiac decompensation, 19 cases ; in 6 of these thrombi were found in the coronaries. (6) Hearts with hypertrophy from healed valvular defects, 21 cases. (7) Hearts with luetic aortitis with involvement of the aortic ring (aortic insufficiency), 9 cases. (8) Cases with cardiac failure following hypertrophy due to an adherent pericardium, 2 cases. Non-infectious myocardial failure occurred in 202 cases (12 per cent) in a series of 1682 adult necropsies.

He concludes as follows : The anatomical changes in the myocardium have been studied in myocardial failure resulting from hyperpiesia, chronic glomerulonephritis, right ventricular hypertrophy, defective valves, luetic aortitis, and adherent pericardium. There are no anatomical changes except coronary sclerosis and myocardial fibrosis. Coronary sclerosis of serious degree was present in 22.5 per cent. Myocardial fibrosis was found in a marked or moderate degree in 20.5 per cent and in a slight degree in 30 per cent. There is usually a close correspondence between the situation and extent of myocardial fibrosis and the distribution and degree of the coronary sclerosis. Myocardial fibrosis is usually due to coronary disease, but occasionally rheumatic infections may give rise to a slight degree of fibrosis. Myocardial strain (hypertensive or non-hypertensive) is not a cause of myocardial fibrosis. Luetic myocarditis is rare. Myocardial failure is rarely due to anatomical changes in the myocardium. It may be explained as an exhaustion of the cardiac muscle.

Etiology of Failing Heart.—G. A. Allan⁴ writes on the etiology of 320 consecutive cases of failing heart. Of these, 242 were valve cases, and 78 myocardial cases. Of the 320 cases, 148 (or 46.2 per cent) were definitely rheumatic, this being by far the largest group. Of the 242 valve cases, rheumatism was found to be the cause in 145, or 60 per cent, accounting for 68.5 per cent of the female cases and 51.2 per cent of the male cases. Definite syphilitic infection was noted in 63 (or 19.7 per cent) of all the cases, and in 53 (or 22 per cent) of the valve cases. It reached its highest percentage in pure aortic incompetence, in which evidence of syphilis was obtained in 70.75 per cent of the male and 66.66 per cent of the female cases. The Wassermann reaction was positive in 51 of the 63 cases ; in the other 12 the

test was not applied, but there were definite clinical signs of the infection. Evidence of syphilis was not obtained in pure mitral stenosis or in combined mitral stenosis and aortic incompetence in either sex. Renal disease or arteriosclerosis occupies third place as an etiological factor, being present in 28 (or 8.75 per cent) of the cases; but in the 78 myocardial cases it was found to account for 27 (or 34.6 per cent) of these. In 43 cases (or 13.4 per cent) no history of an etiological factor was ascertainable.

REFERENCES.—¹*Presse méd.* 1924, Aug. 16, 681; ²*Ibid.* 1925, April 4, 433; ³*Amer. Jour. Med. Sci.* 1924, Nov., 648; ⁴*Glasgow Med. Jour.* 1924, Aug., 81.

HEELS, PAINFUL. (See FEET, PAINFUL.)

HERNIA, INGUINAL.

E. Wyllys Andrews, M.D., F.A.C.S.
Edmund Andrews, M.D., F.A.C.S.

A. MacLennan¹ has made a vigorous protest in answer to the recent utterances of Sir Arthur Keith in regard to the acquired nature of inguinal hernia in the adult. With this the reviewers are entirely in sympathy, and they feel that, in view of the unfortunate legal aspect of the matter, the lending of such a prominent name to the support of a view which is almost unanimously condemned by students of the subject cannot fail to have a harmful effect.

THREE THOUSAND CONSECUTIVE HERNIOTOMIES.

Type	No. of Operations	6 mos.— 1 yr. followed	1 yr. or over followed	Total	Recur.	Recur. per cent
Inguinal male child indirect ..	1013	89	174	263	0	0
" " adult indirect ..	1155	103	229	332	28	8.7
" " child direct ..	4	0	1	1	0	0
" " adult direct ..	280	28	57	85	14	16.4
" " child direct and indirect ..	2	0	0	0	0	0
" " adult direct and indirect ..	98	19	23	42	5	11.9
" female child indirect ..	124	10	12	22	0	0
" " adult indirect ..	113	7	16	23	1	4.4
" " child direct ..	0	0	0	0	0	0
" " adult direct ..	3	2	0	2	1	50
" " child direct and indirect ..	0	0	0	0	0	0
" " adult direct and indirect ..	1	0	0	0	0	0
Femoral male child ..	11	1	0	1	0	0
" " adult ..	32	8	3	11	1	9.09
" female child ..	10	0	2	2	0	0
" " adult ..	48	4	10	14	2	14.2
Umbilical male child ..	11	0	3	3	0	0
" " adult ..	11	2	1	3	0	0
" female child ..	9	2	0	2	0	0
" " adult ..	23	6	4	10	1	10
Ventral male child ..	5	2	2	4	0	0
" " adult ..	14	2	3	5	1	20
" female child ..	1	0	0	0	0	0
" " adult ..	18	1	3	4	1	25
Epigastric male child ..	2	1	1	2	0	0
" " adult ..	9	2	2	4	1	25
" female child ..	0	0	0	0	0	0
" " adult ..	3	0	2	2	1	50
	3000	289	548	837	57	6.8

MacLennan puts forth the following arguments in favour of the congenital or saccular theory: (1) The great prevalence of hernia in infancy. (2) Removal or excision of the sac cures most hernias, without which step no amount of suturing the canal avails anything. (3) The discovery of persisting sacs without any history of hernia both at operation and autopsy. (4) The onset of a congenital hydrocele is indicative of increase of free fluid in the belly; no one believes that the fluid pressure created the sacs. (5) The sac of an adult hernia is exactly identical with that of the admittedly congenital type in the new-born. (6) Many cases said to be traumatic fail to reveal evidences of trauma on exposure, and many cases of incomplete hernia can be shown to have a small empty continuation of the sac into the scrotum. (7) The frequent history of an adult's hernia being a recurrence of one cured in childhood. (8) Frequently in an adult, and usually in a child, with a single hernia, investigation of the 'well' side reveals a small empty sac.

W. B. Coley² presents an interesting analysis of 3000 consecutive herniotomies, of which 837 were followed. A study of the table on the preceding page is very instructive, confirming many facts which we have hitherto suspected but not been able to prove on account of too limited series of follow-up reports.

In the first place, it is seen that the results in children are uniformly excellent. Nearly 300 operations followed showed no recurrences. In children almost any type of operation offers a very sure hope for cure. Simple sac removal in many cases has proved quite sufficient. In this series a Bassini operation was the rule, but one of the reviewers³ has recently called attention to the efficacy of a 'minimal' herniotomy in children, and the results of series reported from Continental clinics amply confirm this view.

In adults it is clear that there is room for improvement. Herniotomy is not an operation to be lightly undertaken. The figures of 8.7 per cent recurrences in adult males surely should shock surgeons out of their serene confidence that we are doing justice to these patients. These figures do not stand alone. Practically every series which has been followed in recent years gives similar results. These are for simple oblique hernias.

In the direct hernias the results are worse still: 50 per cent of women and 16 per cent of men had recurrences. As pointed out by one of us,³ a direct hernia is seldom a serious disease. They seldom attain large size, rarely emerge from the external ring, and the dome-shaped sac does not permit strangulation. They are more amenable to truss management than the oblique type. These facts, combined with the enormous recurrence-rate, should make us hesitate about surgical intervention unless very good reason exists. If the hernia causes pain or is growing rapidly (both unusual occurrences), operation is indicated. Otherwise they are best left alone.

Finally, it is well known that recurrences are frequent in umbilical or ventral hernias, a fact which Coley's figures confirm. Epigastric hernia is usually considered as an easy problem. The surgeon thinks that the closure of the tiny ring is a simple affair, but our results show that it is quite otherwise: 25 per cent of males and 50 per cent of females recurred. Much more radical operations with careful overlapping of the rectus sheath are indicated. Simple purse-string closure of the tiny hole is doomed to failure.

M. G. Seelig and K. S. Chouke⁴ have made a very fundamental contribution to the science of hernia surgery. By a series of experiments on the dog they have shown that it is impossible to establish a union between muscle and fascia by suturing. These two fundamentally different tissues cannot be united. They sutured the fascia lata of dogs to the underlying muscle with silk and different kinds of catgut threads placed both continuously and interruptedly.

In no cases in which there was clean wound healing was it possible to establish a union. The stitches invariably cut through the soft muscle, and separation took place even though there was no tension on the suture line. Trauma to the muscle yielded no better results. The only way of creating a real adhesion was extensive infection of the suture line, an end hardly to be sought for by the surgeon. From these experiments they argue that the Bassini operation is of very doubtful value. There is generally such a deficiency of the internal oblique aponeurosis that we have only red muscle to sew with.

E. Andrews⁵ has published a method of herniotomy utilizing only white fascia. If the above work is considered conclusive, the suture of the so-called conjoined tendon to Poupart's ligament can be of very little value. Autopsies and operations on recurrent hernias tend to confirm the view that such a union will not occur. The real pathology of an oblique hernia, apart from the sac, is an enlargement of the internal ring, the hole in the endo-abdominal fascia. In young children or adults with recently acquired hernias this ring will not as a rule have been stretched, and simple sac removal is the part of the Bassini operation which brings about the cure. Surgeons have very generally ignored the internal ring. The point where the hernia or cord emerges through the muscles is usually attacked, but the fundamental pathology lies deeper. Hernias do not strangulate at this point, but they do at the hole in the endo-abdominal fascia. This structure is not exposed at all in most herniotomies. We do not go deep enough. If one retracts the muscles and separates the lower layers, this ring can be exposed. In many cases it is a well-defined sharp hole in a strong fascial plane. In such cases it can be simply narrowed to such a point as just to permit the exit of the cord. Other cases require a little more dissection. The lower edges of this fascia, near to Poupart's ligament, are often thinned out and appear to be of little use to us. It has been found, however, that in almost every case, if one retracts the muscles and searches upwards, a stronger layer is encountered which can be pulled down and sutured to Poupart's. Herniotomies of this type are more radical than those ordinarily done, and actually get at the root of the trouble. In no other part of the abdomen would any surgeon ever think of closing a laparotomy without utilizing this layer, and it should not be neglected in hernias.

REFERENCES.—¹*Glasgow Med. Jour.* 1925, March, 164; ²*Ann. of Surg.* 1924, Aug., 242; ³*Med. Jour. and Record*, 1924, July 16, 54; ⁴*Arch. of Surg.* 1923, No. 7, 553; ⁵*Ann. of Surg.* 1924, Aug., 225.

HOOKWORM DISEASE. (See ANKYLOSTOMIASIS.)

HUMERUS AND FEMORAL SHAFT, EXPOSURE OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. K. Henry¹ describes the best incisions for exposure of the humerus and femoral shaft. This distinguished professor shows how anatomy may be respected, time saved, and wide access given for operative purposes. The accompanying illustrations (*Figs. 27-30*) are sufficiently descriptive in themselves.

In the case of the humerus, the patient lies with the limb close to his side and supported by the operating-table. The elbow is extended, and when required is flexed by the operator.

Exposure of the femur from the outer side of the limb is popular because it does not enforce reflection; the surgeon cuts down on bone with a feeling that the femorals are safe. The inconvenient, unsightly, and bloody wound suggests, however, that security has been attained at a price, and with a certain disregard for structure. The incision transects the oblique fibres of



Fig. 27.—Cut through skin and deep fascia along the dotted line. (The arrow marks the 'step-down' at the acromioclavicular joint.) Expose (1) the deltoid attachment to the outer third of the clavicle, (2) the inner edge of the deltoid, and (3) the outer edge of the biceps. Continue the division of deep fascia throughout the upper third of the forearm. Split the brachialis.

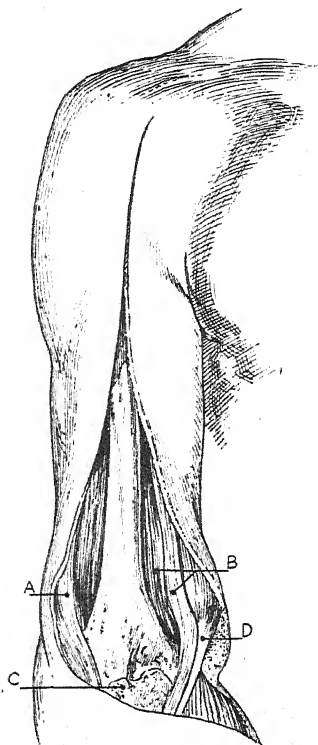


Fig. 28.—Separate the split brachialis from the bone; retract the inner and outer portions of the muscle. Relax it by flexing the elbow. The lower half of the bone is now exposed. In the figure the elbow-joint is opened and the coronoid process is seen. If the exploration of the elbow-joint is not required, check the cut in the brachialis two finger-breadths above the epicondyles. A, Brachialis (outer portion). B, Brachialis (inner portion). C, Coronoid process of ulna. D, Biceps tendon.

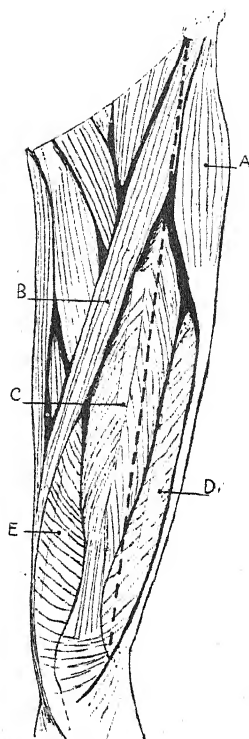


Fig. 29.—Cut through skin and fascia along the dotted line, from the anterior superior spine of the ilium to the outer angle of the patella. Find the plane of cleavage between the rectus femoris and vastus externus one hand-breadth below the great trochanter, where the rectus sinks into the angle between the sartorius and the tensor fascia. A, Tensor fascia. B, Sartorius. C, Rectus femoris. D, Vastus externus. E, Vastus internus.

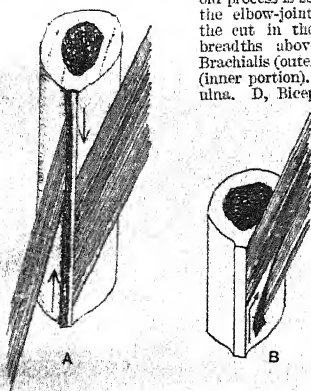


Fig. 30.—Work the ruge into the acute angle A which the muscular attachments make with the bone. B shows how the ruge tears into a muscle when used in the reverse direction against the obtuse angle.

the vastus externus, the goal of four perforating arteries, and of the large descending branch of the outer circumflex; and unless the patient is maintained in a lateral position, the surgeon works in discomfort. The method described here respects anatomy, is almost bloodless, and gives a wide and convenient exposure. Over twelve inches of the shaft, from the level of the small trochanter to the lower epiphysis, are freely available; the surgeon looks directly down on the front of the bone, and can see both sides of it in comfort. When separating the soft structures from the bone, Henry shows the importance of working the rugine in the proper direction (Fig. 30).

REFERENCE.—¹*Brit. Jour. Surg.* 1924, xii, July, 84.

HYDATID DISEASE, INTRADERMAL REACTION IN.

Robert Hutchison, M.D., F.R.C.P.

Casoni, in 1911, first made use of this phenomenon as an aid in diagnosis. A cutaneous test like that of von Pirquet for tuberculosis yielded indefinite results, but he was able to obtain positive reactions in several cases when hydatid fluid was injected intradermally. Since then the reaction has been studied by numerous other observers, and Dew, Kellaway, and Williams¹ now carry it out as follows:—

The hydatid fluid is obtained by aseptic puncture of cysts from the lungs and liver of sheep. Fluid from cysts showing degeneration or infection is discarded, and care is taken to avoid contamination with blood or serum. The fluid is pooled, since some cysts appear to contain fluid of low antigenic value. No preservative is added, but the fluid is filtered and subsequently incubated to ensure its sterility. It is kept in small, sealed ampoules on ice. When tested from time to time for potency on persons known to have hydatid disease, it retains its antigenic power for at least six months.

In carrying out the test the skin of the arm is sterilized with spirit, and 0.2 c.c. of the fluid is injected intradermally. A fine needle is introduced with the bevel uppermost, and a raised white circular area about 8 mm. in diameter resembling pig-skin is produced by the injection. A control injection of a similar volume of saline solution is made with a separate syringe and needle about 7 to 10 cm. away. The wheal caused by this last injection rapidly fades, whereas in a typical positive reaction that produced by the injection of hydatid fluid rapidly increases in size, tends to extend by pseudopodial outrunners, and may reach 5 cm. in diameter. This wheal has generally reached its maximum in fifteen to twenty minutes. It is surrounded by a zone of erythema 4 or 5 cm. wide which fades with the wheal in the course of an hour or so. This immediate reaction is usually followed some hours afterwards by the appearance round the site of the injection of a large area of erythema and deep induration which may have a definite edge. This delayed reaction varies greatly in its time of onset, in its extent, and in its duration. It may appear simultaneously with the wheal, but more often after a period of eight to twelve hours. It may last from twenty-four to seventy-two hours. In some cases almost the whole of the limb becomes hot and red, with extensive diffuse induration and oedema of the subcutaneous tissues. The condition may simulate cellulitis, except for the absence of tenderness or enlargement of the regional lymphatic glands and the slight degree of associated general disturbance. Apart from a little itching and a sensation of heat and weight in the limb, the patient does not, as a rule, complain. Microscopical examination shows that these appearances are caused by an oedematous infiltration of the subcutaneous connective tissue, the tissue bundles being separated by exudation of fluid. There is some vascular reaction and an accumulation of eosinophil leucocytes. The delayed phase does not invariably occur, and in the authors'

opinion the essential feature of the reaction is the occurrence of the immediate wheal.

In some cases special care is needed to avoid mistaking pseudo-positive for genuine reactions. This is more particularly so in cases of jaundice with pruritus, in those with generalized skin disease, and in patients with a tendency to urticaria related to abnormal sensitiveness to a foreign protein. In a hæmophilic boy a positive result was not confirmed at operation, when the suspected tumour proved to be a hæmatoma. The presence of a deep-seated cyst, however, was not excluded. There is also the possibility to be considered that some individuals may be sensitive to sheep protein which may be accidentally present in the testing fluid. With due precautions as to adequate control the reaction appears to be absolutely specific. A very large number of tests have been performed on patients in whom no hydatid cyst was discovered at operation or autopsy, with uniformly negative results. Care in interpretation and experience are needed so that the observer may not be misled by pseudo-positive reactions.

It will be noted that the writers regard the 'immediate' urticarial wheal and not the 'delayed' erythema as the essential feature of the reaction, and the patient must be observed for the first half-hour and after twenty-four hours. The test is a specific one, and in pre-operative or doubtful cases is of extreme value, giving 92 per cent of positive results. Suppuration or rupture of the cyst does not cause disappearance of the reaction, but the 'delayed' phase is inhibited or suppressed. In post-operative cases the test remains positive, and even cured patients may give a reaction sixteen years after operation.

REFERENCE.—¹*Med. Jour. of Australia*, 1925, May 9, 471.

HYDROPHOBIA.

J. D. Rolleston, M.D.

Major J. Morison¹ has treated persons severely bitten by animals proved to be rabid, or whose behaviour suggested rabies, by intravenous injections of *Antirabic Vaccine*. At first one dose of 2 to 3 c.c. was given at the end of the usual fourteen days' treatment. Later the course of treatment was begun with one and still later with three intravenous doses. After 59 cases had been treated, with 3 failures, the number of doses was increased to five and subsequently to seven. The vaccine used was the ordinary 1 per cent brain and cord emulsion of carbolized fixed virus. The rate of injection should not exceed 0.5 c.c. per minute, and the dose was 2 c.c. No local or general symptoms followed intravenous injection, which was preferred by many patients to the subcutaneous method. Although it was too early to estimate the value of the method, the treatment could be regarded as safe, as 720 injections had been given to 169 patients without a single accident or alarming symptom at the time of injection or subsequently.

A. Hempt² has made numerous experiments with the *Etherized Vaccine* introduced by Alivisatos, and found that by a short course of treatment it was possible to confer on animals a degree of immunity which could only be obtained by a much longer course with non-etherized vaccine. The dosage for adults was 1 to 2 grm. in mild, 3 grm. in serious cases, and 4 grm. in the gravest cases. Vaccination is completed in three or four days, and immunity is established in four to six days. Six thousand persons have been treated by this method within the last three years with only 3 deaths, 2 of which occurred during treatment and 1 in the fortnight following treatment. The advantages of the method are that it is rapid and only exceptionally causes any unpleasant reaction.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1924, xii, 333; ²*Ann. de l'Inst. Pasteur*, 1925, 632.

HYPERPIESIA. (See BLOOD-PRESSURE.)**HYPERPNŒA as a Diagnostic Procedure in Nervous Diseases.**

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

For several years it has been known to physiologists that in healthy individuals all the symptoms of *tetany*, including carpopedal spasms with interosseal attitude of the hands, tonic spasms of the facial and jaw muscles, increased electrical and mechanical excitabilities of nerve-trunks, etc., can be temporarily induced by making the individual carry out a period of forced breathing for two minutes or upwards. The urine meanwhile becomes temporarily alkaline owing to excessive removal of carbon dioxide through the pulmonary alveoli. In normal individuals these manifestations of hyperpnœic tetany are remarkably uniform; but in patients affected with abnormalities of the nervous system, whether functional or organic, the results of hyperpnœa may be very different and sometimes of considerable diagnostic importance. Some patients, for example, in addition to muscular rigidity, show emotional reactions, probably of thalamic origin. Grimberg,¹ of New York, found that these emotional phenomena were specially marked in *hysterical* patients. Hyperpnœa carried out by him in five successive cases of this sort produced, in addition to the usual symptoms of tetany, emotional outbursts and major hysterical attacks, whereas in two cases of suspected *epilepsy* a typical attack of epilepsy with unconsciousness was produced, thereby clinching the diagnosis previously in doubt.

Interesting observations in the same connection have been made by Rosett² in *organic affections of the spinal cord*. Thus, in total transverse lesions the symptoms of tetany are confined to the muscles above the level of the lesion, whilst the muscles caudal to the level of the lesion remain flaccid throughout the period of forced breathing. On the other hand, in cases of organic pyramidal disease the effect of hyperpnœa is temporarily to increase the rigidity of the affected muscles and to render more evident the exaggeration of deep reflexes and the presence of an extensor plantar response. In degenerative diseases of the anterior cornual cells, as in progressive muscular atrophy and amyotrophic lateral sclerosis, the fibrillary tremors of the affected muscles become increased in intensity during the period of hyperpnœa, or they may even appear for the first time in early cases of the disease. Another interesting point to which Rosett directs special attention is the occurrence, in extra-medullary lesions compressing the spinal cord, of *myoclonus* in the muscles below the level of compression. Myoclonus of this sort is limited to the trunk and the large proximal muscles of the limbs, i.e., those of the buttocks, thighs, hips, abdomen, thorax, neck, and arm: he has never seen it in the distal muscles, i.e., in the leg, foot, forearm, or hand muscles. The myoclonus induced by hyperpnœa is a massive contraction of entire muscles repeated at a rate of four to eight per second. It first appears as a slow tremor; with the continuance of the forced breathing it increases in amplitude and becomes a well-marked alternate contraction and relaxation of whole muscles, each muscle acting independently and out of time, as it were, with its neighbours, so that no movement of the limb is produced except accidentally, when the contraction of one muscle happens to coincide with the relaxation of its antagonist. The myoclonus persists as long as the hyperpnœa goes on. The foregoing phenomena are of great interest, and merit further observation by neurologists.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, May 16, 1475; ²*Ibid.* Feb. 7, 423.

IMBECILITY, MONGOLIAN. (See MONGOLIAN IMBECILITY.)

IMPETIGO CONTAGIOSA.

E. Graham Little, M.P., M.D., F.R.C.P.

J. H. Blaisdell¹ contributes a personal experience of epidemics of impetigo contagiosa amongst children in hospitals, especially maternity hospitals, in which in a series of 144 cases 6 deaths occurred. Early recognition of the character of the eruption and of its importance is essential. He recommends the use of the following ointment in preference to the traditional application of ung. hydrarg. ammon.: Boric acid 2 grm., sulph. præcip. 2 grm., vaseline 30 grm. In children over 18 months $1\frac{1}{2}$ grm. of salicylic acid may be substituted for the boric. He emphasizes the advantage of using soap from a collapsible tube, and water applied with sterile gauze, in cleaning up the exudate. It is important to recognize that as much care should be taken with each dressing as for a surgical operation, and physicians and nurses should use exactly the same precautions to avoid contact of hands or clothes with infected articles before approaching the patient. At the conclusion of an epidemic, the most rigorous disinfection of the room and furniture must be practised, and it is recommended that the walls should be repainted and the ceiling whitewashed.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1924, ii, 833.

INFANTILE PARALYSIS. (See PARALYSIS, INFANTILE.)

INFLUENZA.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—D. Nabarro and J. F. H. Stallman,¹ who report three personal cases, state that *arthritis* is one of the rarer surgical complications of influenza, as they have found only three previous cases on record, reported by Slawyk, Dudgeon and Adams, and Henry respectively, in which *B. influenza* was actually obtained in pure culture from the joints. The present cases occurred in children, ages 1 year and 11 months, 8 months, and 1 year respectively. In all three the knee-joint was affected. A Gram-negative bacillus resembling *B. influenza* was obtained in pure culture from the joint in all, and in the third case from the cerebrospinal fluid also. Two recovered, and one died of meningitis, like two of the previously recorded cases, though the joint lesion was well on the way to recovery. Stallman's comments are as follows: (1) Without bacteriological proof the evidence of the relation of the joint lesions to influenza is unsatisfactory. (2) The joint lesions are usually monarticular, but may be multiple, and may occur weeks or months after the primary illness. (3) The majority of joint lesions complicating or following influenza are benign, ending in complete resolution in most cases, a little thickening or slight deformity remaining in a few. Severe suppurative arthritis may occur in a minority of cases, and some may prove fatal. (4) The best form of treatment is based on conservative lines in the simpler forms, viz., fixation in a suitable splint and slinging. Aspiration, repeated if necessary, is better than open drainage. (5) The prognosis in the simpler forms is good, both as regards life and the function of the joints involved.

The *pleuropulmonary complications* of influenza may readily simulate an acute abdominal emergency, especially when, as often happens, physical signs in the lungs are ill marked or absent. R. Vignard,² who reports two cases, one of which was mistaken for renal colic and the other for intestinal obstruction, draws attention to the following distinctive features, which indicate that the condition is due to influenza: (1) A previous history of generalized pains, slight laryngitis, epistaxis, and especially sore throat. (2) The general condition is characteristic, the patient being asthenic, the features drawn, the face thin and of a yellowish hue. (3) On palpation the pain is not deeply seated, but is localized in the abdominal wall.

P. Schmidt and M. Weinberg³ record a case of influenzal meningitis in an infant, age 11 months, following a fall on the head. *B. influenzae* was isolated seven times in succession in pure cultures from the cerebrospinal fluid, as well as from the throat and nose, without the presence of any catarrh. Both parents were likewise *B. influenzae* carriers, the father having the organism in his nose and the mother in her throat. It is possible that the addition of hæmoglobin to the cerebrospinal fluid by the trauma caused an intense growth of the organism and rendered it pathogenic.

A. Holtinger⁴ describes four fatal cases of cerebral sinus thrombosis following influenza in children in the second year of life. Two cases were of an otogenic nature, while the other two, in which there was no otitis or encephalitis, represented a rare but characteristic complication of influenza comparable with the cases of thrombosis in the arm or leg veins in adults in whom no inflammatory process can be found in the muscles, connective tissue, bones, or in the wall of the vein itself.

REFERENCES.—¹*Lancet*, 1924, ii, 743; ²*Thèse de Paris*, 1914, No. 370; ³*Klin. Woch.* 1924, 66; ⁴*Monats. f. Kinderh.* 1925, xxx, 131.

INSOMNIA.

Henry Devine, M.D., F.R.C.P.

C. P. Symonds¹ suggests the following as a provisional classification of the insomnias: (a) Insomnia due to disease directly involving the sleep centre; the classical example is in certain forms of lethargic encephalitis. (b) Insomnia due to over-excitability of cortical nerve-cells from intoxication or anæmia; this occurs in infections, uræmia, cerebral compression, etc. (c) Insomnia resulting from the presence of unwonted stimuli which inhibit the sleep reflex; the most familiar causes in this group are muscular postures and tensions, pain and discomfort, and emotional disturbances.

Treatment is considered under the headings of *drugs*, *habit formation*, and *relaxation*.

Narcotics are of value in the treatment of insomnia for two reasons: First, the toxic effect of insomnia upon the cortical cells may be more severe than that produced by the drug; and it is well known that insomnia may lead to depression of the higher mental faculties, and eventually to coma and death. Second, small doses of narcotics often facilitate the onset of true sleep. **Bromide** either alone or in combination with **Chloral**; **Paraldehyde** for quick action; **Sulphonal** for delayed effect; **Medinal** as a useful all-round narcotic; the **Coal-tar Analgesics** and **Opium** for pain or discomfort, comprise the therapeutic stock-in-trade.

As regards *habit formation*, stress is laid on the value of a ritual of some kind when sleep is threatened. For this reason an invalid, whenever it is practicable, should sit up in a chair before bedtime when his bed is made, so that he may not altogether miss the experience of 'going to bed'—the habitual conditioned stimulus preceding sleep. New rituals often have to be initiated. A fresh bedroom is often helpful, and a ritual consisting of some such sequence as the following: a warm bath, into bed, a cup of warm milk, a solemn plugging of the ears with cotton-wool, perhaps a few minutes' reading, and then lights out.

Muscular relaxation is a great aid to sleep, and it is an art which patients can be taught to acquire limb by limb until they can themselves practise completely bodily relaxation. This principle of treatment has been found especially efficacious in certain cases of encephalitis lethargica in children, when motor restlessness has been the most prominent symptom of insomnia. After the preliminary rites of warm bath, sleeping draught, and ear plugging, the child is tightly rolled in a long sheet which is fastened with safety pins, the arms being included so that he is immobilized.

C. H. Woolbert,² writing on this question of sleep and muscular relaxation, points out that muscle systems operate in a kind of hierarchy. Most firmly enthroned of all are the primary reflex systems controlling heart-beat, flow of blood, operation of vital organs, and breathing; next come those developed in the organism's early days—use of arms and legs, back, torso, and neck muscles; later, and probably overlapping the earlier systems, muscles of the eyes, ears, face, and head; lastly—coincident with the development of speech—the muscles of jaws, lips, tongue, and throat.

Thus consciousness as a complex of muscle systems is a pyramid with the organic systems at the base and the muscles of thinking, reasoning, and speech at the top. This hierarchy operates to provide the difference between sleep and waking consciousness, and sleep is accounted for in the formula: Remove the higher systems from activity, and consciousness departs altogether; weaken the lower, and consciousness is in a precarious condition, especially if the higher systems are affected by fatigue. When the lower systems are thrown out of function, the higher circular reflexes either stop at once, or, in abnormal cases, ultimately wear themselves out; in either case consciousness breaks up. Remove the lower entirely, and death is instantaneous. Normally the beginning of sleep is the relaxation of the muscles that hold the body erect. As soon as these muscles are relaxed, the prime determiner of higher systems is taken away, and the higher systems then are kept in function by only a veritable bombardment from the outside world or from strongly determined circular reflex arcs within their own system—emotional states, fixed ideas, tunes running through the head, attempts to solve a problem, etc. The next step in normal sleep is the sequential relaxation of each of the systems hierarchically dependent upon the erect-holding systems. Finally, through the sufficient dissolution of the complexity that makes consciousness, sleep comes. Certain therapeutic inferences arise from these observations. For sound sleep, exercise in particular the muscle systems below the head; for if the body is tired the mind will rest also. If restless in sleep, study how to relax, first of all, the muscles of the legs, back, and neck. Then reduce the breathing rate: high tension almost invariably is accompanied by rapid breathing; low tension by slow breathing. Also hands and feet, fingers and toes, must be inert. If thoughts crowd thick and fast and will not leave, let the jaw drop, make the muscles of the cheeks and lips flabby, avoid screwing up the muscles around the forehead and the eyes, see that the tongue lies limp in the mouth, and make certain that the muscles of the throat are not in any way tensed. These last-named muscles, together with those of the jaw, tongue, and lips, are more likely than any others to get in the way of sound sleep. Make sure to observe the right order of relaxation: gross lower systems first, then the finer systems below the head, and, finally, the fine systems of the head. Sleep is synonymous with carrying out the following order in relaxation: Reduce the breathing rate; then relax legs, back, abdomen, and neck; then arms, hands, fingers, and toes; next the muscles around the eyes, forehead, scalp, and ears; and, finally, those around the mouth, jaws, tongue, and throat—the muscles of speech and conceptual thought.

In the course of an article on sleep, sleeplessness, and sleepiness, Sir F. W. Mott³ lays emphasis on the value of a thorough physical examination, as so many sleepless patients have distressing functional derangements which lead them to believe that they are suffering from some bodily disease. Such patients are often highly suggestible, and should be made to understand that they are not the subjects of organic disease; that the symptoms of which they complain are only signs of lack of energy flowing to the voluntary and involuntary muscles, due partly to the insomnia; and that with the restoration

of sleep all these alarming symptoms will disappear. Sleeplessness due to pain is best relieved by **Morphine**, either hypodermically combined with **Atropine**, or by mouth; for the lightning pains of tabes, **Veronal** and **Aspirin** may be given, but **Pyramidon** is more effective. For insomnia due to toothache and trigeminal neuralgia, **Croton-chloral-hydrate** with **Tincture of Gelsemium** is recommended. If sleeplessness has its origin in mental strain and unrest, mental conflict, or psychic causes, **Chloral Hydrate** or some other hypnotic of the fatty series—namely, **Paraldehyde**, **Chloretone**, **Chloralamide**; or the coal-tar derivatives—e.g., **Sulphonal**, **Trional**; or one of the barbituric acid series—**Veronal**, **Dial**, **Luminal**, **Bromural**, **Dormiol**, **Adalin**—may be employed.

Sir M. Craig¹ contributes a concise and vigorous article on the use of hypnotics in insomnia. He believes that the fear of prescribing hypnotics chiefly accounts for the half-hearted manner in which the treatment of insomnia is approached. He feels that the deleterious effects of these drugs has been greatly exaggerated and their medicinal value has been largely ignored. Those who hesitate to give a drug of the urea group will prescribe large doses of bromide, which is far more damaging to the lining membranes of the stomach and infinitely more potent in confusing the mind, and Craig states that he has yet to see a patient rendered worse by **Sodium Luminal**. Clinical experience has shown him that sleeplessness, whether in the child or adult, is quickly relieved in the initial stages. It should be the primary aim to prevent the fear of not sleeping arising, and hypnotics should be prescribed early, as otherwise, when at last a drug is given and sleep obtained, the patient is terrified by the experience he has passed through and of again having a sleepless night. Another danger consists in the early reduction of the dose or the total withdrawal of the hypnotic as soon as sleep begins to return. Far wiser, once a dose has been found to give sleep, to adhere to it regularly until the health of the patient has reached a high standard, when withdrawal will be easy and complete. When a drug is prescribed it is a mistake to do so with obvious reluctance, and to say at the same time that you will be glad to see him free from it at the earliest possible moment. To act in this way leaves a conflict in the mind of the patient, who is torn between the fear of injuring his brain by the action of the drug, and that of becoming insane from want of sleep. Far wiser is it to reassure him as to the effect that a sedative may have on his brain, and when he knows that the physician is recommending him to take it because he believes it will preserve his mental powers and bodily health, there will be no difficulty in persuading him to continue. If a patient feels assured that his medical adviser will leave no stone unturned until the insomnia for which he seeks advice is relieved, he will make no experiments of his own; but if he is merely told that many persons suffer from sleeplessness and that he need not worry, he will sooner or later make attempts to relieve it himself.

Insomnia in the Psychoses.—The use of sedatives for restlessness and insomnia in the psychoses has tended to fall into disfavour, and it is felt that these symptoms should be dealt with as far as possible by hydrotherapy, open-air treatment, skilled nursing, etc., rather than by what is described as 'chemical restraint.' This reaction away from the routine and excessive use of sedatives and in the direction of methods requiring individual treatment, is a welcome sign of progress in the treatment of the insane. At the same time the possible uses of sedatives as curative rather than as merely stupefying agents must not be overlooked, as it is no doubt true that the benefits of the enforced rest of mind and body produced by these drugs are often in excess of the toxic effects on the organism resulting from their use. In this connection attention may be drawn to investigations, instigated by Kläsi, on the induction of 'twilight sleep' in mental cases by means of **Somnifen**. This treatment has been

utilized by a number of psychiatrists, and is the subject of a lengthy review by M. Müller.⁵ Somnifen is an aqueous solution of a combination of diethylamine with diethyl-dipropenyl-barbituric acid. The hypnotics of the barbituric acid series form with diethylamine soluble compounds which are quickly absorbed and excreted, and which can be injected intramuscularly or intravenously, and are therefore useful for obtaining a rapid effect. Treatment is carried out as follows: First $\frac{1}{4}$ gr. Morphine and $\frac{1}{100}$ gr. Hyoseine are administered and, in half an hour, two ampoules (4 c.c.) somnifen are injected. This first injection usually produces a sleep lasting six to eight hours, after which one ampoule, or even a half, will continue sleep for another similar period. Usually one ampoule night and morning will suffice to induce a twilight sleep which can be prolonged for six or seven days. The sleep is like that of lethargic encephalitis—the patients can be roused to take nourishment or pass excreta, and drop off again when left quiet. Retention of urine must be guarded against. Favourable results are reported from the treatment, but it is not free from dangers, and it is contra-indicated in cases with marasmus, heart weakness, and kidney disease. The value of this treatment in early stages of illness is stressed, since the rapid recovery removes the usual tendency of a more prolonged cure to produce lasting injury to the personality from a persisting memory of the psychotic manifestations.

REFERENCES.—¹*Brit. Med. Jour.* 1925, i, 869; ²*Psychological Rev.* 1920, Nov., 421; ³*Lancet*, 1924, ii, 161; ⁴*Practitioner*, 1925, Aug., 97; ⁵*Zeits. f. d. g. Neurol. u. Psychiat.* 1925, May, and *Jour. of Ment. Sci.* 1925, April and Oct. (abstr.).

INTESTINE, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

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C. S. Vicar¹ presents some very interesting data gained by study of the metabolism of patients with acute and especially chronic or intermittent high intestinal obstruction. The metabolic picture in these cases bears a remarkable resemblance to that of the uræmia in chronic nephritis. There is a very marked retention of nitrogenous waste products, the blood-urea mounting to extremely high figures. Chloride retention also is the rule, possibly due to loss of chlorides by vomiting. Blood-chlorides are lower. One of the most characteristic phenomena, however, is the disturbance of the sodium and calcium ratio. Ordinarily this is at least 40 to 1, and if it falls much below this level tetany appears. No marked change in the amount of sodium and potassium was noted in these cases, but the blood-calcium in many fell to such an extent that the ratio was disturbed and tetany occurred in a high percentage. Above all it can be shown that such cases invariably tend to have an alkalosis of a greater or less degree. These data afford valuable indications for treatment. The administration of alkalis is contra-indicated. High protein diet is injurious, and liberal administration of Glucose is beneficial. Free use of water is important. Finally, the routine examination of the blood will afford an accurate index of the severity of such cases and serve as a guide to the cure.

It is becoming increasingly evident that deaths in ileus are due to absorption of toxins elaborated in the upper small intestine, rather than products absorbed from the peritoneum or from the site of the obstruction. High jejunostomy is therefore indicated in all cases where there is reason to suspect grave toxæmia. W. E. Lee and T. McK. Downs² report several cases cured by this means. They used a technique similar to that of the Witzel gastrostomy. A high loop is picked up, punctured, a catheter inserted, and the hole and two inches of the catheter buried by over-sewing. The loop is then returned to the abdomen, and the wound closed around the catheter. This can be done quickly with a minimum of shock. Irrigations may be begun in a few hours.

The wound never fails to close spontaneously on withdrawal of the catheter. They believe that in all cases of acute intestinal obstruction which have gone over twenty-four hours, jejunostomy is indicated. H. K. Tuttle³ also favours this method. He is not so inclined to do it at the original operation unless conditions are very unfavourable, as the extent of the toxæmia is difficult to estimate, and often relieving the obstruction will bring about instant relief of symptoms. However, where the operation is not followed by prompt improvement, the addition of a jejunostomy under local anaesthesia will save many cases. Continuance of the vomiting, tympanites, shock signs—as thready pulse—all are signs that warrant further interference. It is unfortunate that, in spite of numerous reports of saving apparently healthy cases by this method, we have not as yet any adequately controlled series of cases which will allow one to speak definitely of its value.

J. S. Brown⁴ and G. M. Gray⁵ each report series of 20 cases of acute *intussusception in children*. The very great importance of early diagnosis is emphasized by both authors, as it is clearly recognized now that these cases uniformly end fatally unless surgical intervention is prompt. The diagnosis is very difficult in the early stages, but if the lesion is always kept in mind it is not impossible. Intussusception should always be thought of in any child who presents the picture of sudden colic with no warning. The onset is more sudden and more violent than benign forms of colic. Early shock, collapse, and vomiting are the rule. Vomiting often begins at once, a marked difference from ordinary colic. The pain is intense, and usually the child screams and writhes with pain within a few minutes. It is at this stage that the diagnosis should be made, as then and only then can many lives be saved. A mass, generally in the right lower quadrant, can generally be felt. Bleeding is a constant sign, but it often does not come on early enough to be of much value. This, of course, clinches the diagnosis, but one should never wait for it to occur.

Immediate laparotomy and reduction of the intussusception is about the only method which has cured any appreciable number of cases. Attempts at reduction by distention of the colon with water are dangerous, may cause rupture, and are seldom successful. Besides, valuable time is lost. In all other operative procedures except reduction, the mortality is practically 100 per cent. This fact cannot be too strongly emphasized. Short-circuiting operations, resections, ileostomy, etc., are more than our patients can stand. Only actual gangrene warrants such operations. Reduction by gradual traction, packing in hot towels, and milking out the inner loop of bowel should be given thorough trials. Brown⁴ suggests that a small snip with the scissors at the border of the infolded bowel will often permit reduction by dividing the narrowest portion of the constricting ring. Closure of the hole in the bowel can be made with but a few stitches. Almost all of these cases in children are of the idiopathic type, and nothing can be done to prevent recurrences. Anchoring the offending loop to the anterior abdominal wall is recommended by some, but has very doubtful value.

J. Gaymer Jones⁶ states that *intussusception in adults* may not be such a stormy disease, and reports 15 chronic cases; 8 of these were due to tumours. In the small intestine these tumours are often benign, but in the colon cancers are the usual cause. Ulcerations in the bowels are also a common cause. As in the idiopathic type, the ileocecal region is the site of election. The diagnosis of the condition in adults without ileus is difficult. Operation is generally undertaken for the relief of appendicitis, carcinoma of the colon, or abdominal tuberculosis, and the intussusception discovered only when the abdomen is opened. Frequently the invagination is secondary to one of these conditions. The operation in such cases is much simpler. (Edema of the

bowel tends to prevent reduction, but it is not so marked as in the acute cases. Adhesions are often more of an obstacle, but they can generally be dissected loose. In case reduction is impossible, one is often in a quandary as to what sort of palliative operation is preferable. Short-circuiting operations are much safer than resections, but in adults there is always the danger that the invaginated loop contains a carcinoma hidden in its folds, and for this reason resection is generally advisable. These resections do not carry the enormous mortality seen in the acute cases.

New methods of intestinal suture are brought to our attention in profusion every year. Generally the end sought in each is complete asepsis of the field, and end-to-end anastomosis is made. Two very simple facts can be stated which vitiate much of this work. First, in the upper alimentary tract, field soiling is of no consequence, as the contents are not highly infectious. Second, in the lower parts, end-to-end suture of the bowel is contra-indicated on account of the fact that the vascular arrangement makes sloughing of the antimesenteric border very likely. In spite of these drawbacks, the difficulty of getting length enough to make a lateral anastomosis, and the ingenuity of the methods devised, necessitate a brief review of some of them.

G. Carossini⁷ describes the use of a *sectional spool*, which is inserted much after the fashion of the Murphy button (Fig. 31). A purse-string at the end of each segment of intestine fits into the saddle, and then the ends are buried by a layer of Lembert sutures. The spool falls apart when healing has occurred, and the smaller size of the fragments is less likely to produce ileus than a Murphy button. It is made of aluminum, which not only has the advantage of lightness but is also partly absorbable.

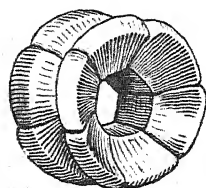


Fig. 31.—Carossini's spool for intestinal anastomosis. (Re-drawn from 'La Presse médicale'.)

The method described by Seton Pringle⁸ needs no description other than the accompanying illustrations (Plate XXVII A). It comes about as close to being an aseptic operation as is possible. The anastomosis is completed, with the exception of the tying of the last stitch or two, before the forceps are removed.

He reports four cases done successfully by this technique. It has the great advantage of simplicity and the lack of any need for special instruments, and it can be applied anywhere in the bowel. The very similar method described by Reinhoff⁹ has the disadvantage of much greater complexity in placing the sutures, and the necessity of introducing a knife by rectum to open the stoma. The uncertainty of just what is being cut by this knife does not incline us to recommend this method. C. A. Roeder¹⁰ has gone even farther in the matter of simplification. He holds the divided ends in narrow crushing clamps, and cauterizes them with a hot iron. A stay suture is then placed on each border of the bowels which holds them together, and the clamps are removed. The crushing and cauterization are insurance against hemorrhage, and the two sides are sufficiently agglutinated together to prevent leakage of bowel contents. The anastomosis is then made by a circular row of stitches just beyond the crushed areas, and, after the closure is complete, the stoma is opened by invagination with the thumb and forefinger.

K. P. Saposchko¹¹ describes an interesting new operation. In many cases where carcinomas of the rectum or sigmoid have been removed there persists an annoying discharge from the incontinent anus. Instead of all the fecal current being diverted through the colostomy, there remains a portion coming through the anus, and there is often considerable tenesmus and pain in this region. In such cases he has shown that it was possible to remove the entire

PLATE XXVIIA.

ASEPTIC RESECTION OF THE INTESTINE

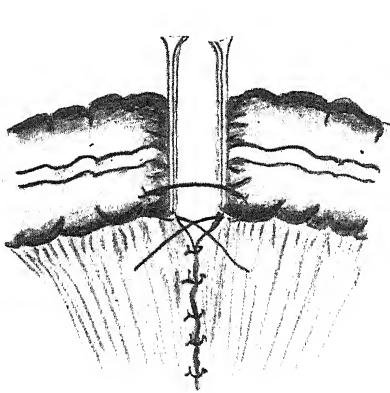


Fig. A.—The placing of the first mattress suture closing the V gap in mesentery.

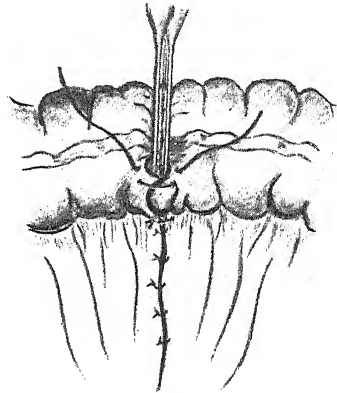


Fig. B.—Forceps approximated, first mattress suture tightened, second suture in place.

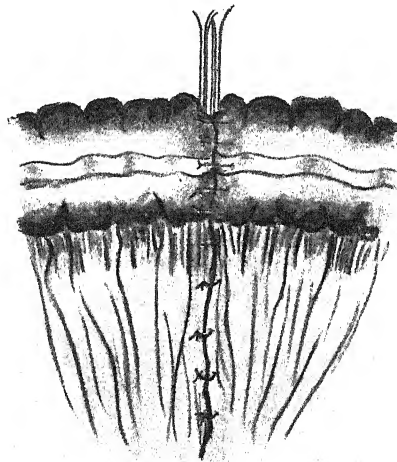


Fig. C.—Row of mattress sutures completed.

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mucosa of the offending loop by freeing it in a circle around the rectum, and by blunt dissection and traction separating it as a tube from the outer layers of the bowel. He did four such cases. No anaesthesia is necessary once the dissection is started, as there are no somatic nerves to these tissues. The mucosa strips readily, and very slight bleeding occurs. Saposchhoff calls this operation '*demucosatio intestini*'. In its limited field it is a real addition to surgery.

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INTRACRANIAL SURGERY, GENERAL. (See also BRAIN, ABSCESS OF; SKULL AND BRAIN, INJURIES OF.) *A. W. Adson, M.D., F.A.C.S.*

Charles E. Dowman,¹ of Atlanta, Georgia, advocates the Injection of 85 per cent Alcohol into the brain cortex for *Jacksonian epilepsy*. The so-called epileptic zone was first mapped out by faradic stimulation. From his results in two cases, he is under the impression that while this procedure will not cure Jacksonian epilepsy, yet from the fact that it does not produce a permanent paralysis it is worthy of trial.

Temple Fay,² of Philadelphia, recommends the administration of Magnesium Sulphate, both orally and by rectum, in the control of *intracranial pressure*. Indications consist of slow or irregular respiratory rates. Contra-indications are shock and previous dehydration. Limitation of fluid intake should accompany this procedure. No toxic effects were observed in a large series of cases.

Max M. Peet,³ of Ann Arbor, in an article on the reduction of increased intracranial pressure, emphasizes the advantages of the intravenous administration of Glucose and Hypertonic Ringer's Solution over the intravenous administration of hypertonic saline and the oral and rectal administration of magnesium sulphate in the presence of increased intracranial pressure. The hypertonic Ringer's solution produces immediate results of short duration without the disadvantage of the compensatory rise of intracranial pressure following hypertonic saline. Following the administration of glucose, the results are not as immediate but of longer duration, and the combination of these two provides an ideal dehydrating mechanism. In addition to the dehydration value of hypertonic glucose, there is an increase in blood volume, combating shock, and a control of acidosis in those cases where emaciation is extreme.

Charles A. Elsberg,⁴ of New York, in a review of 298 major *craniotomies*, advocates the use of Local Anaesthesia. He compares the disadvantages of a general anaesthetic, emphasizing the production of the rise of both general blood-pressure and intracranial pressure following ether, as well as the engorgement of the intracranial veins and associated brain oedema. Chloroform carries with it a lower threshold of safety. General anaesthetics are almost always required where children, or nervous, restless, and delirious patients, are concerned. The technique of injection and the area and tissues necessary to be injected are described. Recovery after cranial operation under local and general anaesthesia is incomparable, in that the former is usually smooth and uncomplicated, and nourishment of the patient can be re-begun soon after the surgical procedure has been completed.

Ernest Sachs,⁵ of St. Louis, describes a method of exposing the frontal lobe which the base of the osteoplastic flap is in the frontal instead of in the temporal region. He asserts that the advantages of this procedure consist of

a more complete exposure in frontal-lobe lesions and a confining of the suture line to the scalp.

Professor Jüngling,⁶ chief surgeon of the surgical clinic of the University of Tübingen, in an article, "Are the Foramina of Magendie and Luschka Open or not?" attempts to explain the phenomena of encephalography of von Brinkmann. Von Brinkmann maintains that the foramina of Magendie and Luschka are normally closed by a fine membrane, and supports this contention by the facts that, in a series of cases, air injected into the lumbar region of the spinal cord did not rise into the ventricles, and that in cases of icterus the bile pigments are found in the subarachnoid space and not in the ventricles. He also injected cinnabar into the lumbar sac, and could not recover it from the ventricles. As further proof, he reports that serial sections of the fourth ventricle revealed no opening of the foramen. He believes that by withdrawal of spinal fluid an opening may be artificially produced in the foramina. Jüngling, disregarding the clinical observations that obstruction of the aqueduct of Sylvius or of the foramina by tumour or adhesion leads to internal hydrocephalus, and the experimental observation that indigo-carmin introduced into the ventricles normally appears in the subarachnoid space, attempts by physical means to explain the contention of von Brinkmann. After an elaborate series of experiments, he concludes that when the body is in a state of complete rest there is slight, if any, exchange of contents between the subarachnoid space and the ventricles, because the aqueduct of Sylvius acts as the tip of a pipette, and a variation of pressure is necessary in order to obtain a flow through it. Motion of the body, with the pulsations caused by cardiac action and respiration, furnish this variation of pressure. From his experiments he feels that it is not possible to say that the foramina of Magendie and Luschka are not open.

Walter E. Dandy,⁷ of Baltimore, Maryland, in an article concerning the treatment of staphylococcus and streptococcus meningitis, suggests and describes a method of Continuous Drainage of the Cisterna Magna. Four cases of streptococcus and staphylococcus meningitis have been treated by this drainage method, resulting in three cures and one death. The operative procedure consists of a mid-line incision over the occiput and the removal of a circular area of occipital bone about $2\frac{1}{2}$ cm. in diameter, and incision of the exposed dura. The frontal end of a small catheter is sutured to both sides of the opened dura; the tube is then sutured to the trapezius muscle with catgut, and the skin with silk. The tube is withdrawn in from four to seven days, and, following this, discharge of fluid into the dressing persists interruptedly from two to seven days. In no instance was there any noticeable effect from the continuous loss of cerebrospinal fluid. This procedure is necessarily restricted to cisternal drainage of staphylococcus and streptococcus infections in which the cerebrospinal fluid is not sufficiently altered in consistency to militate against drainage.

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INTRATHECAL MEDICATION. (See also TABES.)

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The chief diseases, apart from cerebrospinal syphilis, in which intrathecal treatment has proved of value, are meningococcal meningitis and tetanus. An instructive critical review of the subject has been compiled by Pollock and Favill,¹ of Chicago.

The credit of priority in the preparation of a specific immune serum against *meningococcus meningitis* belongs to Jochmann² in Germany and Flexner³ in

New York. Both of these workers independently, in 1903 and 1906, prepared an immune serum for therapeutic purposes. Since the recognition of the different strains of the meningococcus, it is now agreed that a polyvalent serum should always be employed, pending the identification of the particular strain. Once this strain has been ascertained, opinions differ as to whether a polyvalent or a monovalent serum should be used. Until it is proved that a monovalent serum has greater activity for a specific strain than a polyvalent serum has against the same strain, there are obvious advantages in employing the polyvalent one. In the United States at the present day all sera sold in inter-State traffic are now required to be polyvalent, and with a high titre against strains representing four different serological groups. The successful treatment of meningococcal meningitis depends on the early recognition of the disease and its early and assiduous treatment with a serum of high potency and specificity for the type of infecting organism. Some physicians, such as Herrick,⁴ strongly recommend that antimeningococcal serum should also be given by intravenous injection; but nearly all are agreed that, whatever else may be done in the way of treatment, serum should always be given intrathecally. Since symptoms of collapse may arise if the intracranial pressure be suddenly raised, it is advisable to withdraw rather more than a corresponding bulk of cerebrospinal fluid before introducing the serum. The following doses are considered safe at different ages: from 1 to 5 years, 5 to 15 c.c.; from 5 to 10 years, 10 to 20 c.c.; from 10 to 20 years, 20 to 30 c.c.; and over 20 years, 30 c.c. or more. The interval between injections should not exceed twenty-four hours, and in severe cases the injection may be repeated every eight to twelve hours for three or four doses. One drawback to the frequent repetition of injections is the production of a local meningeal irritation with prolonged root-pains and even root-palsies. As the serum takes effect, the meningococci diminish in numbers and become altered in their size and staining property; the extracellular organisms become engulfed by leucocytes, and finally disappear. The serum treatment should be continued until the clinical signs disappear and the fluid becomes physically, cytologically, and bacteriologically clear.

Other routes than the lumbar are sometimes necessary for introduction of the serum. *Intracisternal injection* through the occipito-atlantoid ligament is equally easy and much more efficient than that by lumbar puncture, since fluid thus introduced into the cisterna magna is rapidly diffused throughout the whole extent of the cortical meninges. Direct *intraventricular injections* were first employed by Cushing and Sladen,⁵ and this method has been advocated more recently by Lewkewicz.⁶ Except, however, in severe or complicated cases this route has not yet been recognized as of special value, but when a block in the cerebrospinal subarachnoid space occurs, whether from adhesions or a heavy exudate, other routes of injection apart from the lumbar must be resorted to.

Prior to the employment of a specific serum the mortality of meningococcal meningitis is given as varying from 20 to 75 per cent, by Hirsch,⁷ who in 1886 collected the statistics of forty-one epidemics. Flexner compiled the statistics of eighteen epidemics, and found that the death-rates varied between 42·5 and 90 per cent in different epidemics and at different periods of the same epidemic. Since the treatment by antimeningococcal serum, Jochmann in 1906 had a death-rate of 27 per cent, Levy of 16·2 per cent and 21·7 per cent in two epidemics, and Flexner and Jobling of 25 per cent in 393 cases.

The treatment of *tetanus* by intrathecal injection of antitoxin was first advocated in 1898 by Blumenthal and Jacob,⁸ and its administration by this route has steadily increased in favour. Sherrington,⁹ working on monkeys for the British Tetanus Committee during the Great War, reported in 1917 that all

the controls, i.e., all those receiving subcutaneous or intramuscular injections, had died, whilst the mortality after intravenous injections of serum was 62·5 per cent, and for those treated intrathecally 27·7 per cent. In the human subject, however, it is difficult to estimate accurately the results of intrathecal treatment, not only because so few patients have been treated by this route alone, but because of the well-known difference in virulence of the infection. Golla,¹⁰ in experimental work on animals, found the intrathecal route undoubtedly superior, but later,¹¹ in a review of statistics from war hospitals, he felt that serum treatment in man had been a failure. He stated that, by the time symptoms of tetanus appear, a sufficiency of toxin is already present in the nervous system in such cases as would probably end fatally whether treated or not, whereas, in the milder cases, sufficient toxin to cause fatal tetanus is not manufactured. He concluded that, making allowance for the modification of the disease due to prophylactic injections, there had been no diminution of mortality. Irons,¹² on the other hand, is more optimistic as regards intraspinal injections of antitoxin. He found the mortality in 225 patients thus treated to be 61 per cent, whereas in 21 cases treated without serum it was 85 per cent. In spite of the teaching that if a lethal dose of tetanus toxin has been absorbed by the nerves and is travelling towards the nervous centres before treatment is begun, the outlook is probably hopeless, the British Tetanus Committee believed in giving the patient the benefit of the doubt and in administering large doses of antitoxin at the earliest possible moment by the intrathecal route. They recommended at least 24,000 units in twenty-four hours; 20 c.c. of high-potency serum containing 16,000 units may easily be given intrathecally on the first and repeated on the second day; this, if supplemented and continued by intramuscular and subcutaneous injections, should be sufficient. They do not recommend intravenous treatment because of its greater likelihood of producing anaphylactic shock.

Acute anterior poliomyelitis is another disease in which immune bodies have been shown to be present in the blood of recovered cases. Flexner and Lewis¹³ showed experimentally that the intrathecal injection of an immune serum in monkeys is sometimes effective in preventing poliomyelitic infection when intravenous injections fail. Netter¹⁴ in France, in 1914, was the first to treat human cases with an immune serum. Amoss and Ebersson,¹⁵ in 1918, found that the serum of monkeys recovered from experimental poliomyelitis was definitely protective and neutralizing in the human subject.

In *epidemic encephalitis* Netter¹⁶ again has recommended the intrathecal injection of serum from convalescent patients, although he feels that the most successful cases are likely to be the recent ones, and that the chronic, delayed, and prolonged cases offer a less hopeful outlook.

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JAUNDICE. (See also LIVER EFFICIENCY TESTS.) John H. Anderson, M.D.
Edmund I. Spriggs, M.D., F.R.C.P.

The appearance of bile or of its chief pigment, bilirubin, in the tissues or urine has long been used as a guide to disordered liver function. Hæmoglobin is probably broken down into globin (96 per cent) and hæmochromogen or hæmatin (4 per cent).¹ Hæmatin contains 8·5 per cent of iron, which is split off as hæmosiderin, and the iron-free remainder of the molecule is converted

into bilirubin by the reticulo-endothelial cells (see LIVER EFFICIENCY TESTS, p. 298). In the liver this task falls on the Kupffer cells, though it is not clear if this is done directly or if there is a prebilirubin stage. From the Kupffer cells three courses are open to the bilirubin thus formed: (1) All may pass through the blood capillaries into the hepatic vein; (2) All may pass through the liver-cells proper into the bile capillaries, as in health; (3) Part may pass one way and part another.

Van den Bergh Test.—A flood of light has been thrown on the bilirubin in the blood by van den Bergh² and the test which bears his name. This test (fully described by J. W. McNee^{3,4}) depends on the fact (first described by Ehrlich) that bilirubin in alcoholic solution produces, with diazotized sulphanilic acid, azo-bilirubin, which has a deep-violet colour. Van den Bergh discovered that in some cases the azo-bilirubin is formed in *non-alcoholic solutions*, and describes the following colour reactions.

In Non-alcoholic Solutions.—(1) Reaction with maximum colour in about 30 seconds, known as the *immediate direct* or *prompt direct*. (2) Reaction with colour first showing in 1 to 15 minutes, gradually increasing, known as the *delayed direct*. (3) A mixed effect where a colour appears in about 30 to 90 seconds, and later grows more intense, the *biphasic direct*. "Where no colour appears at all, the reaction is called a *negative direct*."

In Alcoholic Solution.—(4) An immediate colour reaction, known as the *indirect reaction*.

The direct reactions are used qualitatively only, but the indirect may be compared quantitatively with known standards. Many sera have been examined by this test and constant reactions obtained. The test must be done not more than two hours after withdrawal⁴ of the blood for accurate results to be obtained.

An *immediate direct* reaction is given by gall-bladder bile and by the serum in gross obstruction, e.g., stone, cancer of head of pancreas. A *delayed direct* is often seen in cases of bilirubinæmia with associated blood diseases, and in serous fluids from old hæmorrhagic effusions. An *indirect reaction* is given by any alcoholic solution of bilirubin up to a dilution of 1-1,500,000. In consequence all sera which give an immediate, delayed, or biphasic direct give an indirect reaction after addition of alcohol, while a serum giving a negative direct varies in its response to the indirect reaction. Van den Bergh explained these different reactions by stating that the bilirubin which has passed through the polygonal cells gives an immediate direct reaction, and the bilirubin which has passed direct to the blood-stream gives a delayed direct reaction. He thus postulates two kinds of bilirubin, the difference arising from the filtration through the polygonal cells. E. G. Ravdin⁵ adds a third to include the bilirubin of the serum where the direct reaction is negative but an indirect reaction is obtained. This seems unnecessary, especially as she states that clinically "the delayed direct and absent direct cannot be separated".

Classification of Jaundice.—In addition to being a delicate test for the estimation of bilirubin, the van den Bergh test and its interpretation render possible a satisfactory classification of jaundice. Van den Bergh divided jaundice into two types: (1) *Mechanical*, where the bilirubin has passed through the polygonal cells, and is then obstructed and reabsorbed into the blood, giving an immediate direct reaction; (2) *Dynamic*, where the bilirubin has not passed through the liver-cells, giving a delayed direct or no direct reaction. This group includes all other types of jaundice than the frankly obstructive just mentioned. This classification depends on the recognition of two types of bilirubin. Where 'mechanical' and 'dynamic' are mixed, a biphasic reaction is obtained.

McNee gives a more useful classification : (1) *Obstructive hepatic jaundice* ; (2) *Toxic and infective hepatic jaundice* ; (3) *Hæmolytic jaundice*. All icteric cases can be included in these three groups, though clinically they may not be confined to a single division. This classification also depends on "the view that the polygonal glandular cells are not essentially concerned with the manufacture of bile pigment", but transfer it from vascular capillaries to bile capillaries.³

In *obstructive hepatic jaundice* the bile is normally formed, passes through the liver-cells, and on being blocked in the bile-passages is reabsorbed into the blood-stream either directly or by the lymphatics (Whipple and King). The van den Bergh reaction is an immediate direct at first, but it may vary later, as complete obstruction rapidly causes changes in the bile secreted and also in the liver-cells, leading even to necrosis, which complicates the issue and may bring the case into the toxic-infective group. 'Biliary thrombi' sometimes seen in obstructive jaundice are thought to be due to liver-cell damage rather than to be the cause of the obstruction. Their more frequent presence in the next group supports this view.

In the *toxic and infective hepatic* group we find the jaundice following acute fevers, infection, toxæmia, drugs, and that due to yellow atrophy of the liver. As McNee³ says, "it seems probable that both damage to the hepatic cells and obstruction in the bile-passages from cholangitis play a rôle preponderating one way or the other at different times". The van den Bergh reaction is of little use, as it varies throughout its whole range. The biphasic reaction was first seen in this group, and is explained by supposing that some bilirubin is blocked by the damaged liver-cells and passes directly to the blood, while some passes through undamaged cells but is obstructed in the bile capillaries and reabsorbed. Catarrhal jaundice is probably a mixture of the obstructive and toxic-infective types.

Hæmolytic jaundice gives a delayed direct van den Bergh or no direct reaction at all. The possibility of an extra-hepatic type of jaundice was finally proved by the discovery of the action and the wide distribution of the reticulo-endothelial system. In man, bile pigment can be formed outside the liver, mainly in the spleen, which may enlarge in the process. The view now held is that, in hæmolytic jaundice, excessive blood destruction leads to more bilirubin in the blood than the liver can cope with ; this excess remains in the blood and gives a delayed direct reaction if in sufficient concentration. At the same time bile pigment (possibly of hepatic origin) is present in the fæces, the urine remaining clear. Urobilinuria, however, is frequently seen, and may be due partly to the different kidney threshold for bilirubin and urobilin. The skin coloration of acholuric familial jaundice and Addison's anæmia are outstanding examples of the hæmolytic type.

Two other types of jaundice require mention. *Latent jaundice* with a bilirubinæmia, but without icterus or bilirubinuria, owing to the small amount of bilirubin in solution ; this may be obstructive as in cirrhosis or metastatic tumour growth of the liver, or hæmolytic as in Addison's anæmia, icterus neonatorum, and following the administration of salvarsan. *Dissociated jaundice* is a term used by French workers to describe a condition in which either the bile pigment is retained while the bile salts are excreted in the normal way, or vice versa. S. P. Reimann⁶ points out that while bile salts are only formed in the liver, bile pigments are formed elsewhere, and this may have a bearing on dissociated jaundice. McNee³ thinks recognition of dissociated jaundice should be suspended at present.

Clinical use of the van den Bergh Test.—Results are expressed quantitatively in units of bilirubin, one unit being taken as one part of bilirubin in 200,000.

Normal serum contains 0.2 to 0.6 units (functional bilirubin). With serum giving a direct reaction bilirubinuria appears when a concentration of about 4 units² is reached, though C. H. Andrewes⁷ found individual variations; with an indirect reaction van den Bergh holds that bilirubinuria never occurs. McNee agrees, but Andrewes sets forth objections to this assertion. S. C. Harvey⁸ considers jaundice is present when the concentration reaches 1-80,000, though it may not be visible to the eye.

The test and its theoretical interpretation afford a way of explaining and classifying the various types of jaundice met with clinically. Full details of methods and literature are given by McNee,^{3,9} and some important modifications in a later paper.⁴ Ravdin⁵ has estimated its clinical value in 140 cases, and concludes that the test is in accordance with the clinical findings, and differentiates consistently between the jaundice of obstruction and hæmolysis. In 184 cases Andrewes⁷ found the test of value in quantitative estimation of bilirubin in the blood, in distinguishing frankly hæmolytic from frankly obstructive jaundice, and to distinguish pernicious from secondary anæmias. M. F. Fallon, W. F. Lynch, and J. J. Dumphy¹⁰ found it of great use in diagnosing diseases of the biliary tract. It must be noted, however, "that in patients who have gall-stones, without icterus, the bilirubin content of the serum is normal".³ Van den Bergh⁶ suggests that it is of use in prognosis in renal and cardiac disease; Andrewes⁷ has not met such cases. It shows whether blood obtained by aspiration is of long standing or is introduced at the time of puncture. It shows if a skin or serum pigmentation is due to bilirubin or not. W. I. Gerrard¹¹ uses it to detect post-salvarsan liver damage before jaundice appears. Its use in detecting latent jaundice has great possibilities, and already it has been suggested, as a means of differential diagnosis in certain cases of duodenal and gastric ulcer.

References to other clinical uses are given by McNee and Keefer.⁴ "As a test for liver function it is admittedly crude" (Andrewes). With this statement most observers agree.

The Icteric Index.—The 'icteric index' is a term used first by Alice Bernheim¹² to denote the amount of bilirubinæmia. A colorimeter was used for the estimation, and the normal range stated to be between 4 and 6. J. V. Barrow, E. L. Armstrong, and W. H. Olds,¹³ in 77 cases, found a raised icteric index in hæmolytic diseases, cardiac decompensation, pneumonia, malaria, and disturbances of the biliary system. The uncomplicated secondary anæmias show a hypobilirubinæmia. They quote cases and show charts of the index. Harvey⁸ found like results in varicosities, jaundice of various types, carcinoma of liver and pancreas, gall-stones, and pneumonia. He stresses the value of the index in latent jaundice, and gives a normal bilirubin content at 1-200,000, 1-80,000 for clinical jaundice, and 1-50,000 for biliuria.

Estimating hyperbilirubinæmia by the *Fouchet test*, J. D. Garvin¹⁴ obtained positive results in only 15 out of 86 cases. He considers the test of questionable value, especially as many cases of proved disease gave negative results, and pathological conditions other than cholecystitis, notably duodenal ulcer, gave a positive reaction. This is no doubt due to the test not being sufficiently delicate, as it is only accurate to a dilution of 1-60,000, whereas the van den Bergh test detects 1-1,500,000 of bilirubin.

REFERENCES.—¹C. Lovatt Evans, *Recent Advances in Physiology*, 1925; ²H. van den Bergh, *Der Gallenfarbstoff im Blute*, 1918; ³*Quart. Jour. Med.* 1923, July, 390; ⁴*Brit. Med. Jour.* 1925, ii, 52; ⁵*Amer. Jour. Med. Sci.* 1925, June, 850; ⁶*Ann. of Surg.* 1925, Jan., 299; ⁷*Quart. Jour. Med.* 1924, Oct., 19; ⁸*Boston Med. and Surg. Jour.* 1925, March 19, 540; ⁹*Brit. Med. Jour.* 1924, ii, 495; ¹⁰*Boston Med. and Surg. Jour.* 1925, March 19, 536; ¹¹*Brit. Med. Jour.* 1924, ii, 224; ¹²*Jour. Amer. Med. Assoc.* 1924, 291; ¹³*Amer. Jour. Med. Sci.* 1925, April, 583; ¹⁴*Jour. Amer. Med. Assoc.* 1925, Feb. 14, 492.

JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—An epidemic of spirochaetosis icterohæmorrhagica, still known in Germany as Weil's disease, is described by Körner,¹ in a school at Burg, near Magdeburg, in July and August, 1924, when a large number of the scholars developed febrile jaundice and petechial hæmorrhages; 76 in all were affected, but only 26 had more or less marked jaundice. The epidemic was not confined to the school, but spread to the town of Burg. None of the cases ended fatally. The infection could be attributed with certainty to bathing, as no other source of infection could be incriminated, such as rats or other vermin; only bathers were affected, and the outbreak ceased as soon as the bathing was stopped. Other outbreaks of spirochaetosis icterohæmorrhagica traced to bathing have recently been described by G. Railliet² and Garnier.³

E. S. McDowell,⁴ who reports the first fatal case hitherto recorded in New York State, remarks that, though many outbreaks of infectious jaundice have been reported in widely separated parts of the State (see MEDICAL ANNUAL, 1919, p. 213; 1924, p. 231), the cases have been mild, the onset insidious, and the organisms had disappeared by the time the nature of the disease was suspected. McDowell's patient, a man of 43, died after a week's illness with typical symptoms of spirochaetosis icterohæmorrhagica. Spirochaetes were found in the liver and kidneys, and inoculation of a rat with the blood reproduced all the symptoms of the disease. D. M. Lyon and G. Buchanan⁵ describe an outbreak of eight cases of spirochaetal jaundice which occurred at Edinburgh during July, August, and September, 1924, the source of infection being probably a small child from the Malay Peninsula. All recovered, but there was considerable difference in the severity of the attacks, as is common in such epidemics. The hæmorrhagic character of the disease, as manifested by petechial and larger skin effusions, epistaxis, hæmaturia, and hæmatemesis, was prominent in this epidemic.

E. Hindle and H. C. Brown⁶ refer to previous cases of spirochaetal jaundice reported in Great Britain, viz., those of Manson-Bahr (see MEDICAL ANNUAL, 1924, p. 231), Gulland and Buchanan (*ibid.*, 1925, p. 224), and Lyon and Buchanan (see above), and record two cases in a boy of 12 and his sister, age 8, which formed part of an outbreak at a school in the Midlands. The probable source of infection was food or water, as rats and bathing could be excluded. The writers emphasize the importance of repeated examinations of the urine in all cases of undiagnosed fever followed by jaundice, and recommend that spirochaetal jaundice should be added to the list of notifiable diseases.

ETIOLOGY.—E. Hindle,⁷ who has found an organism morphologically identical with *Leptospira icterohæmorrhagiae* in London tap-water, Thames river water, and water from several other sources in the neighbourhood, points out that there is reasonable evidence for the assumption that certain strains of water leptospira may acquire pathogenic properties, and therefore constitute a potential source of human infection. In small numbers the presence of leptospira is harmless, but under insanitary conditions, especially when the water is contaminated by feces, the organism may increase in numbers, and constitute a real source of danger. E. Etchegoin⁸ examined the water from a swimming-bath in which some persons had contracted infectious jaundice and found a spirochaete morphologically resembling *Leptospira icterohæmorrhagiae* but non-virulent for guinea-pigs.

TREATMENT.—Körner¹ employed intragluteal injections of 5 c.c. of Serum prepared by immunization of rabbits with *Leptospira icterohæmorrhagiae*. A marked improvement was usually noted after the injections, especially relief of headache. In three of their cases, Lyon and Buchanan⁵ used serum prepared from a series of organisms isolated from

PLATE XXVIII
JOINT TRANSPLANTATION

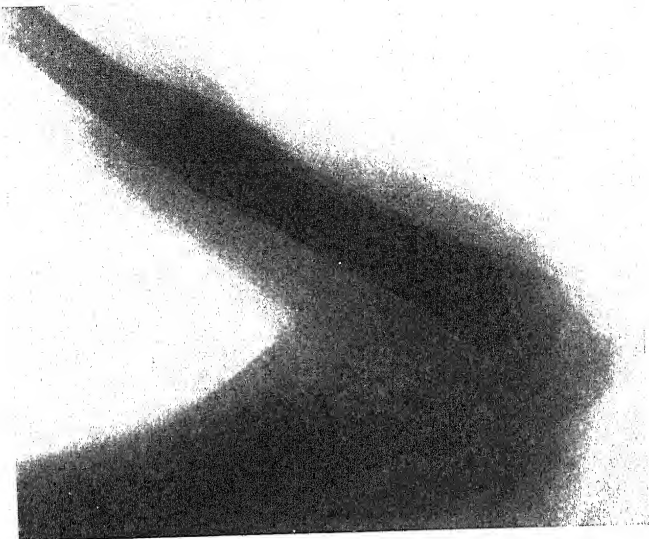


Fig. A.—Skigram four months after homoplastic substitution of the upper half of the humerus with the lower half of the femur from an amputated leg.

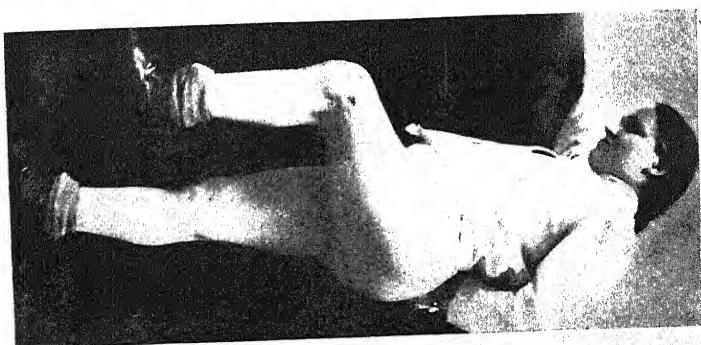


Fig. B.—Homoplastic knee-joint transplantation, five years after operation.

Plates XXVIII, XXIX, by kind permission of 'Surgey, Gynecology, and Ob

PLATE XXIX.

JOINT TRANSPLANTATION—continued

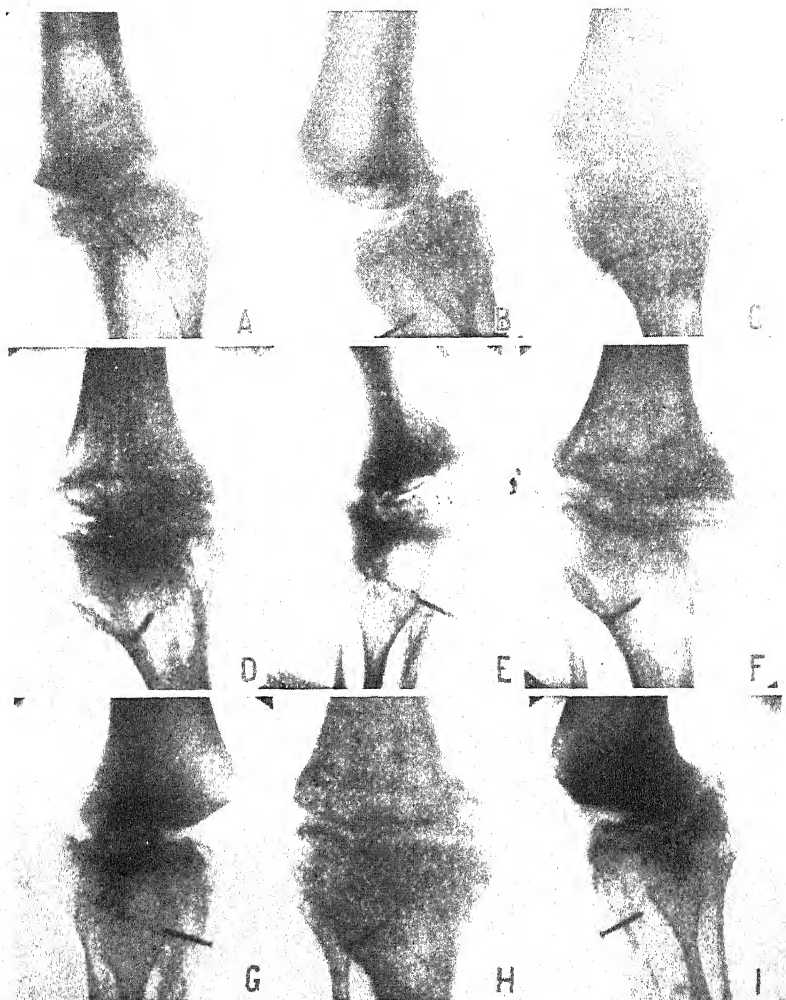


Fig. C.—Skiagraphs of case shown in *Fig. B.* A. After 1 year; B. After 1 year and 4 months; C. After 1 year and 7 months; D and E. After 3 years and 9 months; F and G. After 5 years and 9 months; H and I. After 13 years.

caught in East Lothian (see MEDICAL ANNUAL, 1925, p. 224). The temperature fell to normal in each case, but no other immediate effect was noted.

REFERENCES.—¹*Deut. med. Woch.* 1925, 772; ²*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1924, 1502; ³*Ibid.* 1591; ⁴*N. Y. State Jour. Med.* 1925, 19; ⁵*Lancet*, 1925, i, 504; ⁶*Ibid.* 1925, ii, 372; ⁷*Brit. Med. Jour.* 1925, ii, 57; ⁸*Comptes rend. Soc. de Biol.* 1924, xci, 1005.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

G. Buchanan¹ has investigated an East Lothian mine where a number of cases of this disease had occurred among the workers, and in some thick slime on the roof of the working where the infections had occurred, and out of reach of rats, he found by dark-ground illumination the characteristically moving leptospira of the disease, and he also succeeded in infecting rats with typical fatal infective jaundice by intraperitoneal injections of the slime. He thus established a possible source of underground infection in a situation inaccessible to rats.

REFERENCE.—¹*Brit. Med. Jour.* 1924, ii, 990.

JOINT SURGERY, RECONSTRUCTIVE. *E. W. Hey Groves, M.S., F.R.C.S.*

Satisfactory joint reconstruction has never yet been achieved. It is true that many workers, e.g., Murphy, Payr, Lexer, and Putti, have by brilliant and painstaking work made good working joints in the place of those destroyed or fixed by disease. But though such joints are serviceable, they are by no means normal, always representing the characters and appearance of osteo-arthritis.

Joint Transplantation.—E. Lexer¹ has been one of the earliest, most daring, and indefatigable workers on the reconstructive surgery of the joints. It was in 1907 that he conceived the plan of actually transplanting part or whole of a joint from an amputated limb or cadaver to replace a part destroyed by disease. In the sixteen years which have elapsed since then a number of cases have been practised and reported which prove conclusively that such bold transplants can give good results (*Plates XXVIII, XXIX*). The limitations of such operation are very great, especially if we accept Lexer's recent opinion that it is unwise to use post-mortem material. The difficulties and delay in getting a suitable amputated limb seem almost insuperable except as a lucky chance. Whole-joint transplantations have been done chiefly for the smaller joints, e.g., toe-joints substituted for ankylosed finger-joints; but in the hands of most observers the functional results are by no means brilliant. Lexer presents several cases of whole knee-joint transplantation with remarkably good movement and function at long periods (e.g., 10 years and 6 years) after the operation. But the extraordinary thing about these cases is that the X-ray appearance is that of a joint in the late stages of osteo-arthritis. Half-joint transplantations have many times been done with success, and are of much more practical importance than the use of whole joints. Thus the substitution of the fibula head for the upper end of the humerus or the lower end of the radius, or of the first phalanx of the great toe for another articular bone-end, is the best method to adopt when one extremity of a bone has to be removed on account of such a condition as myeloma, which does not involve sepsis or infection.

Arthroplasty.—Lexer gives his experience of arthroplasty and records a remarkably large proportion of successful results. Thus in 300 cases affecting the six large joints he claims that 242 have been successful. The methods he describes are not essentially different from those we have learned from Putti. He condemns the pedicle flap, but uses a free fat transplant cut from the thigh to cover the articular surface. A. Wittek² narrates four cases in which he has

used Lexer's method of arthroplasty for the hip and obtained excellent results in three.

Operative Treatment of Osteo-arthritis.—Max Page³ gives his personal experience (*Plates XXX-XXXII*). Increasing pain or deformity are considered to be indications for operation. The problem of the hip is really that which merits most discussion. In all other joints absolute fixation is comparatively easy, either by apparatus or operation, but in the hip arthrodesis gives very uncertain results in regard to the attainment of ankylosis. Page considers that a simple excision of the joint is the most satisfactory treatment for osteo-arthritis of the hip. He objects to arthrodesis because it so often fails to secure fixation, and he criticizes excision of the femoral head because it shortens the neck of the bone and so favours the adduction deformity which is so liable to arise after any such operation. In the 34 cases of his own series, Max Page admits that he aimed at ankylosis in the majority, but failed to secure it in rather more than half. He claims, nevertheless, that in the great majority of cases pain is cured (19 out of 24), and that in more than half (13 out of 24) there was a fair degree of function maintained.

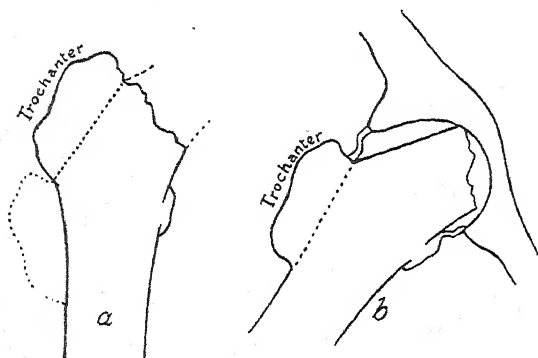


Fig. 32.—Royal Whitman's reconstruction operation for fracture of femoral neck, as employed in osteo-arthritis. *a*, Showing complete loss of the neck after fracture. *b*, Shows reconstructed neck and area obtained from removal and transplantation of trochanter.

(Re-drawn from the 'Annals of Surgery'.)

R. Whitman^{4,5} for the last two years has employed the same reconstruction operation for osteo-arthritis of the hip that he devised for ununited fracture of the femoral neck. That is to say, he saws off the trochanter, disarticulates the hip, removes the head of the bone, fashions the neck as a new head, and then re-implants the trochanter lower down on the femoral shaft, putting up the limb in full abduction (*Fig. 32*).

Contracted Knees in Poliomyelitis.—Alwyn Smith⁶ makes out a good case for an open operation upon those knees which require correction. A longitudinal incision is made behind the joint, the inner head of the gastrocnemius divided, and the main vessels and nerves turned aside in the midst of a pad of fat. It is not until the posterior common ligament and the posterior cruciate have been removed that the knee can be straightened. Probably the same type of operation will be of service in all those cases of fixed flexion of the knee which are quite inadequately treated by tenotomies.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1925, June, 782; ²*Wien. klin. Woch.* 1924, No. 38, 926; ³*Brit. Jour. Surg.* 1924, July, 152; ⁴*Ann. of Surg.* 1925, June, 1108; ⁵*Ibid.* 1924, Nov., 779; ⁶*Brit. Med. Jour.* 1924, ii, 1092.

PLATE XXX.
SURGICAL TREATMENT OF OSTEO-ARTHRITIS

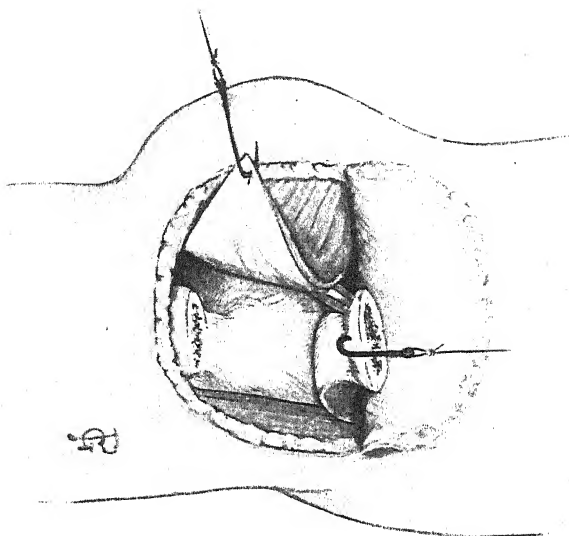


Fig. A.—Operation on hip-joint: supero-external approach: exposure completed.

MEDICAL ANNUAL, 1926

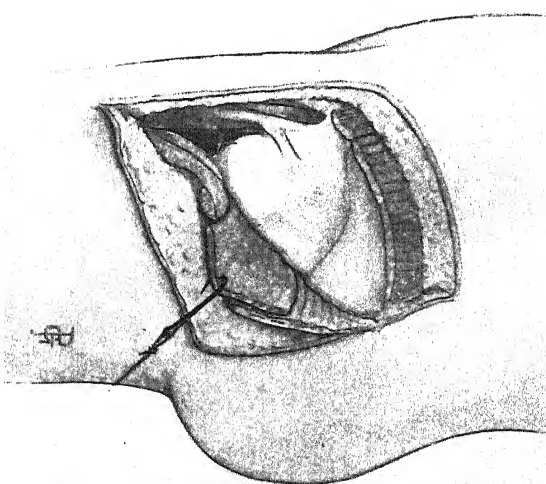


Fig. B.—Operation on hip-joint: supero-anterior approach: the muscle flap turned down.

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PLATE XXXI.
SURGICAL TREATMENT OF OSTEO ARTHRITIS—continued



Extension of hip-joint after dislocation: result after one year: bony fixation, with head of femur displaced somewhat upwards.

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MEDICAL ANNUAL, 1920

PLATE XXXII.

SURGICAL TREATMENT OF OSTEO-ARTHRITIS—*continued*



Fixation with beef peg after an old excision of head and neck of femur for a wound
X-ray nine months after operation: hip stable, function good.

By kind permission of 'The British Journal of Surgery'

KALA-AZAR.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGICAL AND EXPERIMENTAL.—Great light has been thrown on the vexed question of the mode of infection in kala-azar by recent team work by the staff of the Calcutta School of Tropical Medicine, confirmed by the Indian Kala-azar Commission. L. E. Napier¹ closely studied the distribution and environment of indigenous Calcutta cases of kala-azar treated at his clinic at the Hospital for Tropical Diseases. He found that in the crowded northern Indian portion of the city the great majority of the cases were imported, and but few infections arose from them; whereas, on the contrary, in parts of the southern area with numerous Anglo-Indians (in the modern sense of that word of mixed races), nearly all the cases were infected locally. A careful investigation of the local conditions in these two areas showed, firstly, that in the northern area with very few infections there was very little vegetation or soil, but paved courtyards to the houses; the people almost always slept in the upper stories, and cattle were the only common domestic animals, being often located on the ground floor of the houses. In the area with numerous infections, vegetation was almost invariably present in close approximation to the houses, growing in an earth soil contaminated with organic matter, while the people usually slept on the ground floor, and fowls and ducks were commonly present. Masonry houses were more often infected than bamboo huts. Entomological investigations showed sand-flies and midges (*Culicoides*) to be especially prevalent on the ground floors of the area of many infections, but bed-bugs were equally common in both parts, pointing to one of the former rather than the latter as the carrier of the infection. A further advance was made by R. B. Lloyd, L. E. Napier, and R. O. Smith² by means of precipitin blood tests, suggested and carried out by the first-named. The blood in *Phlebotomus argentipes*, the sand-fly commonly found in houses in Calcutta, when caught in the northern area of few infections, nearly always contained cow's blood, very rarely human blood, and never human blood if caught in cow-sheds, indicating that this insect always prefers to bite cows rather than man. On the other hand, in the southern area of numerous infections, and but few cows, in 7 human blood only was found, and in the other 3 tested cow's blood was also absent: thus explaining the frequency of infections in the southern as compared with the northern area if *Phlebotomus argentipes* is the true carrier. The next and most crucial step is furnished by the experimental work of R. Knowles, A. E. Napier, and R. O. A. Smith³ in feeding *P. argentipes* on kala-azar patients in Calcutta during the rainy season of 1924. This was considered the favourable time in view of McCombie Young having found most new cases to become clinically evident in the epidemic areas in the immediately succeeding early cold weather months, while the long-sought-for assistance of an entomologist had now been obtained in the third-named worker. The results were most suggestive, for "in 10 of 11 consecutive experiments, female laboratory-bred *P. argentipes*, fed upon the parasite-containing blood of kala-azar patients, showed typical herpetomonad forms in the fore-gut or mid-gut at the third to the fifth day after the feed. No less than 25 out of 56 such-fed flies showed herpetomonads, and in 6 instances the infection was a heavy one, although the patient's blood films had shown only scanty *L. donovani* present". Further, 811 control sand-flies showed nothing resembling a herpetomonad, and none were found in 46 control *P. argentipes* fed on persons not suffering from kala-azar.

The above-described Calcutta work was communicated to the newly appointed Indian Kala-azar Commission, who at once instituted confirmatory experiments, and S. R. Christophers, H. E. Shortt, and P. J. Barraud⁴ soon reported finding flagellates, from the third to the fifth days after feeding, in

5 of 17 *P. argentipes* fed on the peripheral blood of kala-azar patients with positive spleen punctures; and in a later report the same workers⁵ obtained similar positive results in 14 out of 53 of these sand-flies. Thus there is now good reason to hope for an early complete solution of the most interesting and important outstanding problem of tropical parasitology.

In last year's MEDICAL ANNUAL the work of H. E. Shortt and C. S. Swaminath on the intraperitoneal infection of mice with the hind-gut contents of bed-bugs fed on kala-azar patients' blood was noted, and they have now published further investigations on this suspected carrier, and report⁶ having found that *Cimex lenticularis* shows a far greater and more lasting development of flagellates than *C. hemiptera* when fed on flagellate cultures of *L. donovani*, although the latter is the common bed-bug in Assam; but they do not lay much stress on the observations from the epidemiological aspect. The same workers report⁷ a series of experiments prolonged over a year in which *Macacus rhesus* monkeys, 78 per cent of whom are susceptible to infection by inoculated kala-azar spleen and liver emulsions, were submitted to the bites of large numbers of *C. hemiptera* previously fed on the blood of kala-azar cases and to contamination by the insects' faeces, with entirely negative results: leading them to conclude that this insect is not the carrier of the disease. H. E. Shortt and C. S. Swaminath⁸ report the production of systemic infection in a *Macacus rhesus* by intradermal inoculation of spleen puncture material from a case of kala-azar. E. D. W. Greig and S. R. Christophers⁹ have succeeded in infecting a *Macacus rhesus* by the introduction of a large amount of a *L. donovani* culture into the lumen of the small intestine by means of a syringe puncturing the wall, the precaution of closing the needle with vaseline, and culturing the punctured peritoneal surface after the procedure, being taken to exclude peritoneal infection.

C. R. Avary and F. P. Mackie¹⁰ have found a *Leishmania* parasite in a skin lesion in a dog in Bombay, although systemic infections in this animal have never been found in India, and R. Row¹¹ confirms this observation in another Bombay dog and thinks it may be a new species.

CLINICAL.—R. Knowles and M. D. Gupta¹² have previously failed to obtain much help from thick films in either kala-azar or in malarial examinations, but now describe a technique which has greatly enhanced their opinion of the method. Four drops of blood are placed at the corners of a half-inch square on a slide, spread over it, dried for at least two hours at room temperature or one hour at 37° C., and then flooded with a mixture of four parts of 2.5 per cent glacial acetic acid and one part of 2 per cent crystalline tartaric acid, both in distilled water, which dehaemoglobinizes in five to ten minutes, when the film is fixed with methyl alcohol, and, after very thorough washing in distilled water, is stained with one drop to 1 c.c. of Giemsa for ten minutes, and allowed to dry free from dust. By this method no less than 34 out of 55 kala-azar cases, or 67 per cent, were diagnosed without the necessity of spleen puncture. P. Ganguli¹³ reports that the aldehyde test when negative in cases of kala-azar of over five months' duration can be relied on to exclude that disease, but positive reactions may sometimes be obtained in other diseases, including chronic malaria, although rarely of a high degree by Napier's scale. J. Dodds Price and C. Strickland¹⁴ have investigated the significance of the splenic index in kala-azar endemic areas in Assam, and conclude that where the clinical signs of that disease are not well marked the splenomegaly of a community in a kala-azar infected area is due to malaria, but well-marked clinical cases of kala-azar must be excluded in working out the index. D. Micheal¹⁵ has worked out the kala-azar incidence on the Pusa agricultural estate in Bihar, and confirms the opinion that it is essentially a house infection, and the

incidence was greatest from October to March. E. D. W. Greig and S. Kundu¹⁶ report a case of kala-azar with glycosuria in which complete recovery was obtained with Antimony and Insulin treatment. J. Cunningham and S. R. Pundit¹⁷ report a new endemic focus of kala-azar in the extreme south-east of India.

TREATMENT.—Further valuable reports have accrued on the use of the newer Antimony preparations in kala-azar, including an important addition to them. L. E. Napier¹⁸ reports favourably on a trial of Stibamine Glucoside supplied by Dr. Henry, of the Wellcome Chemical Research Laboratory, which is an aromatic compound allied to sodium para-amino-phenyl-stibiato, with an antimony content of about 30 per cent, and it kept well in Calcutta in sealed ampoules and is easily soluble in distilled water to make a 4 per cent solution, which was injected intravenously in doses gradually increased from 0.05 to 0.3 gm., and preferably from 0.1 to 0.2 gm., on alternate days. Ten proved cases were treated, and the cure was verified by spleen or liver puncture cultures. The results were far superior to those obtained with antimony tartrate, and compared very favourably with those got with von Heyden '471' and urea-stibamine.

Urea-stibamine continues to be favourably reported on, U. N. Brahmachari, its introducer, recording¹⁹ a further series of 37 cases, in 73 per cent of which sterilization was brought about within ten days as shown by negative blood cultures; in other papers²⁰ he gives further details of its preparation and constitution, and also²¹ tabulates 11 early cases of not over four months' duration showing rapid cures. N. C. Kapur²² records 50 cases treated successfully with this drug at the Calcutta Medical College Hospital, including 25 which had previously resisted antimony tartrates. In the ordinary cases an average of 7 to 10 injections were required, against thirty or more of the first-used tartrates, and some cures were obtained in as little as seven days. J. Dodds Price²³ also reports 8 cases resisting sodium antimony tartrate which cleared up under urea-stibamine, and advises its use in all cases showing no improvement after a few injections of the tartrate. E. D. W. Greig and S. Kundu²⁴ compare the results with the three recent preparations above dealt with, and find them to be of about equal value, their cases being controlled by repeated spleen puncture cultures to ascertain the date of cure. The mean quantity per kilo body-weight in grammes for complete cure was 0.053 with urea-stibamine, 0.6 with '471', and 0.42 in two cases with stibamine glucoside, definite clinical improvement being obtained after three or four injections with each, and, apart from occasional vomiting, the only toxic symptoms noted were pains in the muscles and joints with '471'. [I have also observed this effect in a resistant case.—L. R.].

L. E. Napier²⁵ discusses the important practical question of how to judge when a case is cured and the injections may be safely stopped, based on an analysis of a large number of Calcutta cases, and he points out that the most reliable test, by culturing spleen or liver puncture blood, sometimes fails, while it is not available in 99 per cent of kala-azar cases treated in Assam and Bengal, which now amount to tens of thousands yearly, so clinical data based on laboratory controlled cases are required. He concludes from his inquiry that the maximum curative total dose of sodium or potassium antimony tartrate in any but resistant cases is 4 gm. per 100 lb. body-weight; but in cases in which there is decided increase in weight, reduction of the spleen to the costal arch (or in very large ones by at least 4 inches), and an increase of the leucocytes to above 6000 per c.mm., if the temperature falls to normal by the seventh injection, a total of 2.55 gm. in an adult in 30 injections will suffice; if the temperature falls to normal before the tenth injection,

35 injections should be given; if it falls before the sixteenth injection, give a total of 40 injections; and in longer febrile cases give the full 4 grm. per 100 lb. weight in 45 injections. Anglo-Indians appear exceptionally resistant. The only certain criterion of cure is the subsequent history of continued good health.

H. E. Shortt²⁶ classes the relative value of diagnostic methods and evidence of cure in the following order: cultures of spleen fluid, of liver fluid or of the peripheral blood; examination of spleen puncture films, of liver puncture films; the aldehyde test; and, of least value, examination of peripheral blood films.

H. E. Shortt and U. N. Bramachari²⁷ report a further case of the rare dermal leishmanoid eruption following apparent cure of generalized kala-azar by antimony injections; the case being noteworthy for the considerable improvement under urea-stibamine injections.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1925, April, 755; ²*Ibid.* 1924, April, 811; ³*Ind. Med. Gaz.* 1924, Dec., 593; ⁴*Ind. Jour. Med. Research*, 1925, Jan., 605; ⁵*Ibid.* July, 159; ⁶*Ibid.* 1924, Oct., 391; ⁷*Ibid.* 1925, July, 143; ⁸*Ibid.* 149; ⁹*Ibid.* 151; ¹⁰*Ind. Med. Gaz.* 1924, Dec., 604; ¹¹*Ibid.* 1925, July, 317; ¹²*Ibid.* 1924, Sept., 438; ¹³*Ibid.* 1925, May, 204; ¹⁴*Ind. Jour. Med. Research*, 1925, July, 1; ¹⁵*Ibid.* 131; ¹⁶*Ibid.* April, 695; ¹⁷*Ibid.* 743; ¹⁸*Ind. Med. Gaz.* 1925, Jan. 24; ¹⁹*Ind. Jour. Med. Research*, 1925, July, 21; ²⁰*Ibid.* 111, and 1924, Oct., 423; ²¹*Ibid.* 1924, Oct., 397; ²²*Ind. Med. Gaz.* 1925, May, 206; ²³*Ibid.* 1924, Sept., 464; ²⁴*Ind. Jour. Med. Research*, 1925, April, 679 and 689; ²⁵*Ind. Med. Gaz.* 1924, Oct., 492; ²⁶*Ibid.* Nov., 551; ²⁷*Ind. Jour. Med. Research*, 1925, Jan., 463.

KAPOSI'S DISEASE. (See SARCOMATOSIS CUTIS.)

KIDNEY INSUFFICIENCY. (See EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

KIDNEY, SURGERY OF.

Sir John Thomson-Walker, F.R.C.S.

Urea Concentration Test.—K. O. Robertson¹ concludes, from a study in 62 cases of disease, in many of which the urinary tract was involved, that the test, even when controlled and amplified by estimation of the blood-urea, serves merely as an indication of advanced impairment of the renal function; thus, in chronic nephritis it indicates when two-thirds of the renal tissue have been destroyed. The test is not delicate enough to show the effect of slight changes in the renal efficiency, and is therefore of little or no help in elucidating obscure conditions in general medicine.

Antiseptics.—V. Leonard² states that the ideal urinary antiseptic should be chemically stable, non-toxic in therapeutic doses, non-irritating to the urinary tract, should exert an antiseptic action in high dilution in urine of any reaction, should be eliminated in the urine in sufficient concentration to exert a local antiseptic action and at such a rate that continuous antiseptic action may be attained, and finally it should be capable of being administered by mouth. These qualities are possessed to a high degree by Hexyl-resorcinol, as shown by the writer's investigations. (See GONORRHOEA.)

F. H. Redewill and J. E. Potter³ claim that Mercurochrome-220 soluble introduced intravenously "is excreted in large quantities by the kidney and is secreted by the prostate, seminal vesicles, and other glands of the genito-urinary tract, and thus comes into direct contact with inflamed areas in this tract by way of the urine and blood-stream". The best results are obtained in patients who have mild reactions after injection, and when the drug is given in doses small enough to avoid too early saturation. The results of its use in 525 cases of non-tuberculous genito-urinary infections are described, and while a high percentage have been cured or improved, there remain a few

cases which did not respond to the treatment, and a small percentage of cases were found to present a decided hypersensitiveness to the drug. Experiments are described which were carried out to determine, if possible, (1) why certain cases do not react to mercurochrome, (2) how cases hypersensitive to mercurochrome may be recognized in advance, and finally (3) whether a mercurochrome renal function test can be devised or not. Their conclusions in these respects are, however, not definite. The drug should be freshly prepared and given every forty-eight hours.

Cholesterol.—W. MacAdam and C. Shishkin⁴ find that the cholesterol content of the blood appears to be a fair measure of the degree of *resistance to infection* possessed by the individual, and are of opinion that blood-cholesterol estimations form a useful practical guide to the degree of operative risk in cases of urinary obstruction. Of 88 unselected cases of prostatic obstruction which have been investigated, 18 gave a low cholesterol value, i.e., less than 0.130 per cent, and of these, 16 died of pyelonephritis while 2 recovered. Of the other 11 deaths in the series in which the blood-cholesterol was 0.130 per cent or higher, only one death was due to an ascending urinary infection. In only about 50 per cent of the patients with a low cholesterol value who subsequently died of pyelonephritis did clinical opinion of the general condition of the patient contra-indicate operation, and all of these showed more or less defect in renal function, upon which, rather than upon the latent sepsis, did the clinical manifestations depend. The clinical condition alone, or the degree and type of local sepsis in the form of cystitis present to a greater or less extent in all these cases, do not afford reliable information as to the power of resistance to infection of the individual; but the writers are of opinion that blood-cholesterol estimations are of value in this respect. Genito-urinary sepsis with the risk of ascending infection is more serious than nitrogen retention from defective renal function, for cases of the latter which gave a normal or high cholesterol value acquired a normal blood-urea content after a period of suprapubic drainage, and uniformly successful results were obtained from prostatectomy thus postponed. The combination of a high blood-urea and a low cholesterol content, however, is of very serious prognosis, and of 8 such cases in this series, all died save one. The test is of much less value in cases of malignant disease of the prostate, probably because of the high blood-cholesterol content commonly met with in malignant disease in general.

In a discussion on *non-tuberculous infections of the urinary tract* at the Urological Section of the Royal Society of Medicine,⁵ Dudgeon said that among the types of bacterial infection of the urinary tract were those due to: (1) A special group of hæmolytic bacilli, isolated by himself, of which he had met with many cases. The clinical course resembled paratyphoid, and in some of the cases the same organism had been identified by serological tests in both the bowel and urinary tract. The course of the infection was short and acute, lasting for two or three weeks and then clearing up completely, in contrast to that due to the *B. coli*. Vaccine treatment produced immediate rise of temperature and return of severe clinical manifestations, and should not have been commenced until the temperature had been normal for several days; in any case, however, patients usually recovered satisfactorily without it. (2) *B. coli*. Two strains were met with—a hæmolytic variety, accounting for 70 per cent of cases in the male and 30 per cent in the female, and a non-hæmolytic variety in which these sex-percentages were reversed. Treatment by vaccines was not satisfactory, but, if employed, these should be autogenous, because of the two types of infection, of which the hæmolytic was the more likely to derive benefit from vaccines. In the instances in which second attacks had been investigated by Dudgeon, the organism found was always identical with

that causing the first attack, and he thought that it may have been lying dormant in some part of the urinary tract although the urine had cleared up completely in the interval. (3) *B. proteus*. Although regarded as non-pathogenic by some, this organism may lead to the most acute infection and be recovered from the intestine and blood-stream. A vaccine was sometimes successful when the acute stage was over. (4) *Staphylococcus albus*. The presence of this organism in large numbers with pus in the urine was, in the speaker's experience, invariably associated with calculus.

In this discussion, Thomson-Walker⁶ stated that the common type of acute case was characterized by prodromal symptoms such as loss of appetite, headache, want of energy, irritability, bowel disturbance, and, perhaps, slight increased frequency of micturition during a period of from four to seven days before the acute symptoms develop. The acute symptoms often come on suddenly, with urgent micturition followed by intense bladder irritation, soon after which one or more rigors occur and the temperature rises to 103 to 104°. Small amounts of highly-coloured, cloudy urine with a fishy smell are passed frequently, and cultivation of it yields an abundant growth, most commonly of *B. coli*. Blood may be present, and the patient may have noticed a slight terminal hæmaturia. Flatulent distention of the bowel, associated with constipation, is apt to be prominent, and may be a distressing feature. At this stage, symptoms may develop which indicate the site of the main infection; thus, pain in the back or abdominal pain which becomes localized to the loin as a dull ache, associated with tenderness and muscular resistance in front and behind, and at times with attacks of ureteral colic, indicates an infection of the renal pelvis. The presence of a palpable enlargement of the kidney in addition, suggests pyelonephritis or pyonephrosis; if the pain, tenderness, and resistance become aggravated, the temperature swinging in character, and the urine clear, with subsequent escape of pus in the urine and amelioration of other symptoms, the latter condition is present. Clear urine throughout the illness, together with a swelling in the loin and symptoms of infection, point to a cortical infection with perirenal inflammation which is likely to lead to perinephritic suppuration.

The onset of difficulty of micturition or retention of urine after an acute onset of the symptoms mentioned, together with a feeling of fullness or aching in the rectum and perineum, pain on defæcation, and aching in the testicles, point to prostatitis or seminal vesiculitis, and on rectal examination the prostate will be found enlarged and very tender and the seminal vesicles distended.

Uncommon and obscure types of acute urinary infection are those presenting neither renal pain nor enlargement, nor symptoms of prostatic or vesicular inflammation. High temperature, with urinary symptoms either completely absent or so slight as to be overlooked, may be puzzling, especially in children and infants, in whom nervous symptoms such as squinting, vomiting, and convulsions are apt to be present as well. Pain may be a very prominent symptom, and such conditions as appendicitis and renal or ureteral stone must be distinguished. Hæmaturia may, rarely, precede by some days any bladder or kidney symptom, and the presence of bacteria in the urine may remain unsuspected unless looked for. Lastly, there is a small group of cases in which the renal cortex is infected by way of the blood-stream and the urine remains clear and sterile. Such cases are almost always due to staphylococcal infection, and in two cases mentioned by the writer there was a very definite antecedent staphylococcal infection of the skin, and in one an interval of a year had elapsed between the cure of this and the onset of the cortical renal infection.

As regards chronic urinary infection, three common varieties were referred to: (1) Recurrent pyelitis and cystitis, either where there is a persistent infection of the renal pelvis or bladder which from time to time flares up into an acute attack, or where the patient's urine is sterile between the attacks; in the male some of the latter cases are due to reinfection from an infected seminal vesicle, but in the remainder, and always in the female, such reinfections are due to bowel conditions such as chronic stasis, chronic appendicitis, colitis, piles, dysentery, or cholecystitis. (2) Chronic cystitis, other than that due to some local condition in the bladder, may be secondary to quiescent pyelitis, or to chronic infection of the prostate and seminal vesicles. Of 100 cases of urinary infection due to the *B. coli* in which the urine from each kidney was examined, in 42 there was bladder infection but the urine from each kidney was sterile, in 28 both kidneys were infected, whereas in 30 this was the case with only one kidney. (3) Bacilluria without local symptoms but with toxæmia.

Movable Kidney.—A review of the literature leads C. P. Mathe⁷ to believe that Nephropexy has lost favour because, too frequently, it has been performed without sufficient indication, because the technique has not uncommonly been faulty, and, finally, because there has been failure on the part of surgeons to realize the necessity of exposing the upper part of the ureter for the purpose of dealing with such conditions as aberrant vessels, adhesions, and other causes of kinking, which, if undealt with, remain to defeat the purpose of the operation.

The writer has submitted 90 cases of movable kidney to a complete urological investigation. The right kidney was at fault in 70 cases, the left kidney in 11, and the condition was bilateral in 9. General visceroptosis was associated in 7, whereas in 83 there was no evidence of this condition. As regards age, 13 patients were between the ages of 13 and 21 years, 40 between 21 and 31, 18 between 31 and 41, 9 between 41 and 51, and 10 between 51 and 61. Females numbered 72 and males 18. The writer found that the functional activity of the prolapsed kidney as determined by the phenolsulphonaphthalein test was sometimes found to exceed that of the opposite and more fixed kidney. Treatment comes under three headings: prophylactic, non-operative, and operative. Prophylactic treatment consists in careful physical development of the young, especially as regards exercises designed to increase the strength and tone of the abdominal muscles, the avoidance of constricting bands about the lower chest, and care as to adequate nutrition. Non-operative treatment gave rise to 'relief' in 31 cases, 'great relief' in 5, 'slight relief' in 7, 'no relief' in 10, while in 7 the results were not followed up. The use of belts gave good results in cases in which the symptoms had been present for but a short time and in which the lumbar pain was of the dull, dragging, constant type. Nephropexy was performed in 30 cases, in 28 by Kelly's method. Of the 30 cases operated upon, 14 had had medical and non-operative treatment for a period of from six months to a year with no appreciable relief. Nephropexy gave 'relief' in 25 cases, 'great relief' in 1, 'slight relief' in 2, and 'no relief' in 2. The 2 cases which obtained no relief from operation were subsequently investigated: in one, pyelography showed that the kidney had not retained its position, while in the second a pyonephrosis developed. The writer considers that the indications for nephropexy are: (1) When non-operative measures fail or are tolerated badly. (2) Cases complicated by kinking of the ureter, the results of fibrous bands. (3) When ptosis of the kidney has caused kinking of the ureter over an aberrant vessel. (4) Cases in which adhesions have developed around a prolapsed kidney and hold it down. (5) Where there is reason to believe that the undue mobility, by interfering with the

proper emptying of the renal pelvis, is an important factor in the persistence of a renal infection.

E. Bundschuh⁸ employs a strip of fascia lata 21 to 25 cm. in length and 1 cm. wide for fixing the kidney in cases of undue mobility of this organ. The strip is passed round the 12th rib and through the lower pole of the kidney, and becomes incorporated with the tissues of the part, giving, in the writer's experience, satisfactory fixation. Infection of the renal pelvis is a contra-indication to the use of fascia, and, when present, a stout silk suture is used in place of the fascial strip, and is removed on the twelfth day after operation.

Calculus.—H. P. Winsbury White⁹ states that the more recent observations that have been made on urinary calculi go to show that there is a preponderance of calcium oxalate in renal and ureteric stones, and of uric acid and urates in bladder stones. Phosphate is found in larger proportions as a constituent of bladder stone than of renal stone, and frequently surrounds a nucleus of oxalate, uric acid, or urate. Stones of uric acid or urate in the kidney or ureter soon become mixed with calcium salts, after which they can be identified by radiogram.

J. R. Goyena¹⁰ emphasizes the value of deep percussion of the lumbar region posteriorly in the diagnosis of latent renal calculus, but states that while the production of a painful crisis by this means is of considerable importance along with the other methods of examination, the absence of such a reaction is of no significance as denoting the absence of stone. [A sign of renal calculus much used before the introduction of X rays was Jordan Lloyd's, in which the points of the fingers were plunged deeply over the front of the kidney. The sign was of very doubtful value, and is now never used and probably almost forgotten. The posterior percussion here noted is of no greater value as a diagnostic sign of renal calculus.—J. T.-W.]

W. F. Braasch and G. S. Foulds¹¹ discuss the post-operative results of nephrolithiasis on the basis of 1041 cases of renal calculus of which complete data were obtainable, seen at the Mayo Clinic between 1898 and 1921. Nephrectomy was performed in 402 cases, in the majority of which the kidney was pyonephrotic. A functionless or almost functionless kidney, secondary malignant changes, advanced diffuse infection of the kidney, marked hydronephrosis, and previous operation on the kidney with or without subsequent fistula formation, were the chief indications for nephrectomy. The indications for a conservative operation were: the presence of single or multiple stones easily removed without the production of much damage to the kidney, the presence of multiple or large branched stones, marked infection or some other serious complication in the other kidney, and a history of repeated stone formation in both kidneys. Pyelolithotomy, the operation of choice, was performed in 469 cases, and was followed by 11.85 per cent of recurrences. Nephrolithotomy was performed in 150 cases, and was followed in 24.03 per cent by recurrence; and in 75 per cent of the patients in whom it was subsequently found that stone fragments had been missed at operation it was nephrolithotomy that had been performed. Nephrolithotomy was followed by the lowest mortality—1 death in 150 cases; serious post-operative hemorrhage occurred in 8, in 4 of which bleeding was so severe that a secondary nephrectomy was necessary. In the remaining cases, a combined nephropylolithotomy was employed, with only 4.16 per cent of recurrences.

Hydronephrosis.—Discussing the pelvic type of hydronephrosis, "commonly called intermittent and sometimes described as congenital", Winsbury White¹² states that it is most common in the third decade, involves either kidney with equal frequency, and is twice as common in the female as in the male. Attacks of abdominal pain, most severe early in the case, are characteristic; palpable

renal enlargement is as often absent as present; and the passage of an abundant quantity of urine at the termination of an attack is rare. Evidence of pyelitis has been found by the writer in all specimens that he has examined.

A. J. Scholl and E. S. Judd¹³ report that of 503 cases of hydronephrosis seen at the Mayo Clinic, 464 were submitted to primary nephrectomy, and in 39 a plastic operation on the renal pelvis was performed. These plastic operations proved, on the whole, unsatisfactory, and in 11 of them a secondary nephrectomy was subsequently performed. In 16 cases a complete nephro-ureterectomy was undertaken, with recovery in all, the operation being carried out in most of the cases through two incisions—a lumbar incision and an anterior incision over the lower part of the rectus muscle. There were also 474 cases of pyonephrosis operated upon—primary nephrectomy in 471, and nephrotomy with drainage of the renal pelvis in 3. In only 3 cases was complete nephro-ureterectomy performed, in 1 of which the lower portion of the ureter was removed at a second operation. [These results are disappointing. The fact that 92 per cent of cases of hydronephrosis were submitted to primary nephrectomy suggests that the diagnosis was made, or operation undertaken, only in the latest stage. The failure of plastic operations in over one-third of the cases, with resort to secondary nephrectomy, is a serious indictment of the operation. In the reviewer's experience, it has only been in exceptional cases that plastic operations in hydronephrosis have failed.—J. T.-W.]

Ascending Infection of the Kidney.—S. C. Dyke and B. C. Maybury¹⁴ describe a series of experiments carried out on rabbits, designed to bring about, if possible, an 'ascending' infection of the kidney, using the term 'ascending' in the sense of an infection passing into the kidney via the lumina of the urinary passages. No evidence was obtained as to the possibility of such an occurrence.

Regurgitation of Vesical Contents.—With the object of determining under what conditions, if any, regurgitation of the vesical contents via the ureters to the kidney may take place, J. H. Cunningham and R. C. Graves¹⁵ have carried out a series of experiments on a large number of male rabbits. The writers are of opinion that ascending renal infection is a clinical entity occurring as the result of the regurgitation to the kidney of infected urine even before any form of treatment is instituted, and may be accepted as an explanation of renal infection associated with vesical-neck obstruction in patients whose ureteral orifices appear normal on cystoscopic examination.

Abscess.—N. F. Ockerblad¹⁶ reports 10 cases of *perinephritic abscess*, 6 acute and 4 chronic; 2 were secondary to calculous pyonephrosis, 2 to tuberculous pyonephrosis, and the underlying cause could not be determined in 1. The remaining 5 were due to a metastatic infection via the blood-stream, 1 being associated with a carbuncle of the neck, 1 with septic bronchopneumonia, 1 with influenza and septic renal infarction, 1 with acute streptococcal tonsillitis, and 1 with a prostatic abscess. All the cases were submitted to a complete urological investigation, and all, including the metastatic cases, gave definite evidence of impairment of the renal function on the affected side as shown by the phenolsulphonphthalein test, with evidence of disease on the same side as shown by chemical, microscopical, and bacteriological examinations of the separated urines. Nephrectomy and drainage was performed in 5 cases, and drainage alone in 5. One of the patients died two months after simple drainage; the remainder are alive and well. The writer considers that the finding of pus around the kidney should not prevent the performance of nephrectomy at the same time, "if the condition of the patient is even only fair" and the state of the kidney as shown by urological investigation and exploration warrants its removal.

V. C. Hunt,¹⁷ in a paper on perinephritic abscess, states that a review of the cases reported in the literature and of those observed at the Mayo Clinic fails to show a single instance in which infection of the perirenal tissues led to abscess formation independently of primary renal or extrarenal infection.

Of the 106 cases of perinephritic abscess operated upon at the Mayo Clinic between 1914 and 1924, 19 were secondary to pyonephrosis, 12 to renal stone, 10 to tuberculosis, 5 to traumatic rupture of the kidney, and 1 to an infected hypernephroma, making in all 47 (44.3 per cent) secondary to a primary renal disease. The actual incidence of perinephritic abscess in association with these conditions is, however, low, for during the same period nephrectomy was performed for 742 cases of pyonephrosis and infected hydronephrosis, and 1234 cases of renal stone and 644 cases of renal tuberculosis were operated upon. Of the remaining 59 cases of the series, in 5 single or multiple cortical abscesses were found in kidneys so diseased as to require nephrectomy at the time of evacuation of the perinephritic abscess. In 26 submitted to simple drainage in which the kidney was explored, the perinephritic abscess was found to be in direct communication with a cortical abscess. In the remaining 28 cases the perinephritic abscess was merely opened and drained and the kidney was not examined; but as recovery occurred and no symptoms referable to the kidney were noted, the writer concludes that the source of the perinephritic abscess was a cortical abscess, in view of the fact that in 31 of the cases of perinephritic abscess of so-called extrarenal origin in which an examination of the kidney was made, cortical abscess was present. A strikingly uniform observation has been the absence in most cases of microscopic elements in the urine if the cortical abscess was extrarenal in origin, and not until it communicates with the calices or pelvis do pus- or blood-cells appear in the urine.

Hunt describes in detail 11 cases of the series in which the abscess was apparently metastatic via the blood-stream, the original source of the infection being peripheral, viz., boils in 5, carbuncle in 2, abscess of the thigh in 1, acute tonsillitis in 1, and infection of a finger in 1.

Leukoplakia of the Renal Pelvis.—F. Hinman, A. A. Kutzmann, and T. E. Gibson¹⁸ have collected 31 cases of leukoplakia of the renal pelvis from the literature, and in addition report 2 cases of their own. The occurrence in the renal pelvis, ureter, and bladder of leukoplakia, the structure of which corresponds so closely to that of skin, whereas the organs in question have a mesoblastic and hypoblastic origin, is a finding that has given rise to much conjecture. The writers are of opinion that, whatever the underlying cause of the condition in question may be, the actual change is one of protective cornification, and is a pathological condition which of itself is apparently capable of maintaining a permanent state of chronic inflammation even after disappearance of the primary source of irritation, most commonly calculus or infection of long standing, and which in time tends to undergo malignant degeneration. Kretschmer is quoted as referring to leukoplakia, stone, and infection as almost constant precursors of non-papillary carcinoma of the renal pelvis, and the writers have found that this type of carcinoma as found in the bladder has a similar relationship to leukoplakia in a great many cases. Syphilis is said to be present in but a small proportion of the cases of leukoplakia of the renal pelvis, and even when present its rôle is doubtful. The symptoms are those of a urinary infection (cystitis, pyelitis, pyelonephritis, pyonephrosis); it is usually associated with calculus formation, and the condition may occur at any age, but is most common in the fourth decade and affects both sexes equally. The writers advocate nephrectomy as the treatment of choice, as the condition is incurable and precancerous.

Drainage.—J. O. Rush¹⁹ considers that drainage of the renal pelvis by means of an indwelling ureteral catheter, provided always that only the finest quality lead X-ray catheter is used, is to be preferred to any other method of treatment in the great majority of cases of the pyelitis and pyelonephritis of pregnancy. Pressure of the pregnant uterus upon the ureter is an important factor in the causation of such infections, a view which in the writer's opinion is supported by the fact that spontaneous cure often rapidly follows the termination of pregnancy in the early months. Further, in those cases in which nephrotomy has been performed, Rush has found reports of many in which the renal fistula continued to discharge until the child was born, and after this it rapidly closed. He considers that nephrotomy is unjustifiable in the absence of gross lesions of the urinary tract, and that the induction of abortion is contra-indicated in view of the relief that can be given to those cases that do not respond to simple medical treatment by the passage of a ureteral catheter, of as large a size as can be introduced, up to the renal pelvis. The clinical course of six personal cases is described. Catheters were left *in situ* for periods varying from three to twenty-six days with most satisfactory results, and without the production of pathological lesions in the urinary tract.

[The objections to a retained ureteral catheter in infection of the renal pelvis are that the fine lumen becomes blocked, that the catheter tends to slip out of the renal pelvis, and that the presence of the catheter causes pain which frequently amounts to colic. In the reviewer's opinion the majority of cases do well under medicinal treatment. Catheterization of the ureter, with lavage of the renal pelvis on one or at most two occasions, suffices to check the symptoms in the most severe cases. Nephrotomy or nephrectomy is rarely necessary, and the induction of premature labour is only called for in the very rarest cases.—J. T.-W.]

Tuberculosis.—C. A. R. Nitch²⁰ has reviewed a series of 65 cases of renal tuberculosis, and in 48 of these, submitted to nephrectomy, he has been able to obtain complete post-operative details extending over a period of from three to seventeen years. In those who were not yet free from bladder symptoms the urine had been examined recently by a pathologist. Six are dead two and a half years after operation; 25 are in good health and may be regarded as cured; while 17 are still suffering from bladder symptoms, either from frequency only or from frequency and pyuria, and in 3 of these tubercle bacilli are still present in the urine. Of the 42 survivors, 8 are alive three years, 4 four years, 3 five years, 5 six years, 2 seven years, 4 eight to ten years, and 11 ten to seventeen years after operation. These results are compared with those of other writers and are found to be very similar, and Nitch concludes that the operative mortality should not exceed 2 per cent and that operative cures should not fall below 60 per cent. As regards treatment, the writer removes the entire ureter whenever it is obviously infected, and he finds that of 33 cases in his series, submitted to nephrectomy alone, the operative mortality was 4, the late mortality was 3, 15 are now quite well, and 11 are alive with bladder symptoms, 3 of whom have frequency only, 7 frequency and pyuria, and 1 frequency, pyuria, and tubercle bacilli in the urine; while of 19 cases treated by nephro-ureterectomy, 3 died some considerable time after operation, 10 are now quite well, and 6 are alive with bladder symptoms, of whom 3 have frequency only, 1 frequency and pyuria, and 2 frequency, pyuria, and tubercle bacilli in the urine.

Tuberculosis affecting a kidney the seat of a duplicated renal pelvis and ureter is of particular interest as regards the mode of extension of the tuberculous process within the parenchyma. M. Persson²¹ describes a case in which the upper third and the lower two-thirds of a kidney were drained by a healthy

and an extensively diseased pelvis and ureter respectively. There was a sharp line of demarcation formed by a band of connective tissue, $\frac{1}{2}$ mm. thick, passing from the hilum just below the upper renal pelvis outwards and slightly upwards to the external border. Below this line the pyramids had been destroyed, and replaced by cavities containing caseating material which for the most part communicated with the pelvis. The cut surface above the line of demarcation was quite normal, except for several typical tubercles containing epithelioid cells and giant cells lying immediately beneath the capsule near the upper pole. Within a pyramid, between the largest of these foci and the renal pelvis and at least $\frac{1}{2}$ cm. from the latter, was found a solitary, very recent tubercle, containing epithelioid and giant cells. The upper renal pelvis and its ureter showed no microscopic changes whatever. The writer considers that in this case extension of infection occurred from the lower to the upper segment of the kidney via the subcapsular lymphatic plexus in the renal cortex.

C. Y. Bidgood²² found that out of 89 cases of renal tuberculosis treated by nephrectomy, the wound completely broke down after operation in 16, owing to tuberculous infection of the perirenal tissues. For such gaping wounds, which may take months or even years to heal, the writer advocates secondary suture, and he describes in detail two cases so treated.

N. A. Myll²³ strongly advocates the use of *Heliotherapy* in the treatment of genito-urinary tuberculosis, and gives details of this method as carried out at the Fitzsimmons General Hospital, Denver.

NEW GROWTHS.

F. Hinman and A. A. Kutzmann²⁴ review the literature and report a case of the *embryonal mixed tumour* of the kidney. The modern views as to the origin of such tumours are summarized as follows: (1) From inclusions of Wolffian body tissue which has become displaced and persists among the cells of the developing kidney or metanephros (Birch-Hirschfeld). (2) From aberrant cells of the sclerotome and myotome, etc.; the mixed character of the tumour being explained by the varying nature of the constituents which enter into its ultimate formation from these sources (Wilms). (3) From embryonic true renal tissue, which has persisted and become changed by some process of metaplasia into cellular structures of various types (Ewing).

R. F. Young²⁵ reports 5 cases of *polycystic disease* of the kidneys, 4 of which occurred in males between 36 and 52 years of age, and 1 in a female of 52. In 3 of the males, and in many of the detailed reports of cases in the literature which the writer has consulted, the first evidence of disease was hæmaturia, whereas in women the initial symptom is more commonly that of the discovery of a tumour, probably because in women a transient hæmaturia is more readily missed or attributed to some genital irregularity by the patient. Careful investigation of the history will usually give evidence of renal insufficiency such as headache, nausea, and loss of appetite, with increasing unfitness for work prior to the onset of hæmaturia or the discovery of a tumour. In one case in which pyelography was performed, nothing distinctive was found.

Hinman and Kutzmann²⁶ state that in their experience more than a third of the cases of *malignant renal neoplasm* coming to operation present the three classical symptoms, hæmaturia, pain, and tumour, and that when such cases present these symptoms together the case is not an early one and usually soon terminates fatally in spite of surgical measures. They emphasize the importance of carrying out a thorough urological investigation on the appearance of any one of these symptoms. The incidence of such tumours in adults they find to be from 0.25 to 1.0 per cent, and in children from 0.06 to 0.1 per cent, whereas of tumours in general, 0.5 to 2.0 per cent in adults and about 20 per

cent in children are found to be of the nature of malignant neoplasms of the kidney.

D. Bissell²⁷ considers that, in the presence of *papillomata of the renal pelvis*, the ureter on the affected side is more susceptible to secondary implantation than is the bladder, and is usually involved before the latter. While implants may occur at any part of the ureter, they are more liable to appear at points of injury, as, for instance, when during nephrectomy and partial ureterectomy the ureter is severed and tied. Implants are also especially to be looked for at the vesical orifice, where there is apt to be retardation of the flow of urine. The ureter should be completely removed in all cases of papilloma of the renal pelvis, and, if for any reason this cannot be done at the time of the nephrectomy, the remaining portion of it should be removed as soon after as the condition of the patient permits. The writer considers that the combined transperitoneal and transvesical route, which he describes in detail, is the best one for this purpose.

A. J. Scholl and G. S. Foulds²⁸ describe the 5 cases of *squamous-celled carcinoma* of the renal pelvis that have been under treatment at the Mayo Clinic between the years 1910 and 1922. The patients were between the ages of 53 and 64, and 4 were males. In 4 cases there were associated renal calculi, which in 3 were extremely large and of the 'staghorn' type. Nephrectomy was performed in all the cases; 1 died eight days after operation, 4 within four months of operation, and 1 is alive and without symptoms of recurrence six months after operation. These tumours are almost symptomless. When obstruction occurs, it is the result of a slow gradual occlusion which gives rise to little pain but, at times, to enormous dilatation of the renal pelvis. In contrast to the papillary growths, hæmaturia is seldom a prominent feature. A similar clinical picture is presented by the very rare squamous-celled carcinomata of the ureter. Two types of this variety of tumour are found in the renal pelvis: in the first, the renal parenchyma is invaded early, the kidney is solid and compact, and the parenchyma becomes completely replaced by carcinoma with more or less fibrosis; in the second, the growth is confined to the renal pelvis, and the kidney is extremely large and hydronephrotic, with resulting pressure atrophy of most of the renal tissue. Metastasis occurs early and extensively in both types, and is usually of epidermoid structure, even though the original growth contains both papillary and squamous-celled masses. Because of the comparative absence of symptoms, these cases seldom come under observation while the growth is still in the early stage, and, as the results mentioned above go to show, the prognosis is very poor.

M. Cutler²⁹ has analysed a series of 32 cases of *hypernephroma* of the kidney, the diagnosis of which had been confirmed by microscopic examination of tissue removed at operation. Eight of the cases occurred between 40 and 50 years of age, 13 between 50 and 60, and 7 between 60 and 70, while 23 were in males and 9 in females. The average duration of symptoms from the time of appearance of the first symptom to the time of operation was 3½ years, the longest period being 9 years and the shortest 3 weeks.

Hæmaturia was present in 30, and was the initial symptom in 17 of the cases. Lumbar pain or discomfort was present in 29 cases; in 2 of these it was acute and unusually severe, and in these, recent hæmorrhage into the growth was subsequently found to have occurred. Renal colic occurred in 20 of the 30 cases in which its presence or absence was noted, and in the majority of instances was associated with the passage of long worm-like blood-clots. In 7 cases there was difficulty with micturition or retention of urine due to intravesical clotting; 2 of these were relieved by the spontaneous passage of clot, but in 5 catheterization became necessary. A tumour mass

was palpable in 28 cases. Twelve showed marked constitutional symptoms, such as weakness, unusual fatigue, dyspnoea on exertion, and loss of weight, the last symptom varying directly with the duration of symptoms and being very marked in many. Renal calculi were associated in 5 of the cases, and fever was noted in 24. Definite impairment of renal function was found by differential tests in 4 cases; and pyelography, in the majority of cases in which it was carried out, showed marked distortion of the renal pelvis with frequently, in addition, a lengthening of the calices. All 32 were submitted to nephrectomy: 2 died during operation and 4 shortly after. Four have died, one 7 months, one 15 months, and two 3 years after operation. Eight are known to be living, one 8 months, and seven at periods varying from 2 to 9 years after operation. Fourteen of the patients could not be traced.

[The association of stone and growth in the kidney has always been regarded as rare; the number of these cases in this series (about 17 per cent) is unusually high. The facts that a tumour mass was felt on palpation in 28 of 32 cases, and that two patients died during the operation, point to late diagnosis and severe operation.—J. T.-W.]

REFERENCES.—¹*Glasgow Med. Jour.* 1924, Oct., 222; ²*Jour. Amer. Med. Assoc.* 1924, Dec. 20, 2005; ³*Ibid.* 1925, June 20, 1891; ⁴*Brit. Jour. Surg.* 1925, Jan., 435; ⁵*Proc. Roy. Soc. Med. (Urol. Sect.)*, 1925, April 23, 43; ⁶*Ibid.* 25; ⁷*Surg. Gynecol. and Obst.* 1925, May, 605; ⁸*Zentralb. f. Chir.* 1925, lii, 750; ⁹*Brit. Jour. Surg.* 1924, July, 5; ¹⁰*Presse méd.* 1925, Jan. 7, 19; ¹¹*Jour. of Urol.* 1924, ii, 525; ¹²*Brit. Med. Jour.* 1924, ii, 1043; ¹³*Surg. Clin. N. America*, 1924, iv, 425; ¹⁴*Brit. Jour. Surg.* 1924, July, 106; ¹⁵*Surg. Gynecol. and Obst.* 1924, July, 39; ¹⁶*Jour. Amer. Med. Assoc.* 1924, Dec. 27, 2074; ¹⁷*Ibid.* 2070; ¹⁸*Surg. Gynecol. and Obst.* 1924, Oct., 472; ¹⁹*Ibid.* 1925, March, 428; ²⁰*Lancet*, 1925, i, 1; ²¹*Ann. of Surg.* 1925, Jan., 94; ²²*Jour. Amer. Med. Assoc.* 1924, Nov. 15, 1573; ²³*Ibid.* Dec. 6, 1834; ²⁴*Ann. of Surg.* 1924, Oct., 569; ²⁵*Brit. Jour. Surg.* 1924, Oct., 244; ²⁶*California and West. Med.* 1925, April, 429; ²⁷*Surg. Gynecol. and Obst.* 1925, March, 323; ²⁸*Ann. of Surg.* 1924, Oct., 594; ²⁹*Johns Hop. Hosp. Bull.* 1924, July, 214.

LABOUR. (See also PLACENTA PREVIA.)

W. E. Fothergill, M.D.

A. C. Beck¹ writes on the use of the Abdominal Binder as a substitute for pituitary extract in the second stage of labour. The binder is a simple device, and is in accord with a definite physiological principle. It was probably used long before the invention of the forceps; but it is not mentioned in most modern text-books. Thirty years ago, however, the *American Text-book of Obstetrics* stated that "an abdominal binder is frequently useful in helping the progress of labour in the second stage, particularly in multiparæ having lax abdominal walls". The writer began with an ordinary binder, and later has used a binder made in two parts—a back and a front. The back portion has fine rings on either side, while the front has fine tails on either side. After passing through the rings the tails are controlled by buckles. Thus the binder can be applied snugly to a woman of any size, and can be tightened, loosened, and adjusted as required. It holds the uterus perpendicular and prevents distention of the weaker parts of the abdominal wall, increasing the intra-abdominal pressure and making the pains more effective. Two hundred and fifty cases in which the binder was used as a routine measure were compared with a similar number in which no binder was used. In the binder series the average duration of the second stage was 68.7 minutes, while it was 101.6 minutes in the other series. The binder diminishes the need for forceps, for forceps were required 19 times in the binder series and 35 times in the other series. There were 8 infant deaths in the binder series, against 12 in the other. There are, however, three disadvantages. The help afforded by the abdominal binder is passive, and is thus of no value if the patient's own expulsive forces are not active. The increased intra-abdominal pressure may affect the child if the lower portion of the binder is not loosened between the uterine contractions.

PLATE XXXIII.

CARTILAGINOUS TUMOURS OF THE LARYNX

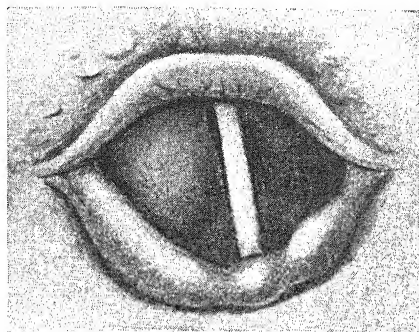


Fig. A.—Intrinsic cartilaginous tumour of the larynx, with fixation of the right side.

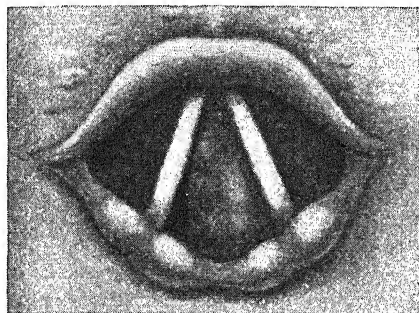


Fig. B.—Cartilaginous tumour in the left subglottic region.

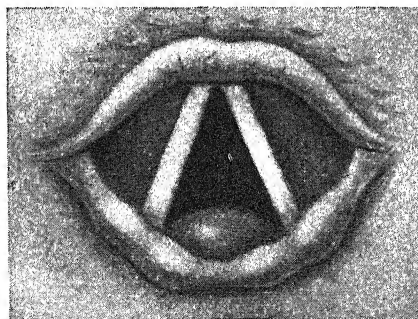


Fig. C.—Cartilaginous tumour in the inter-arytenoid space.

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PLATE XXXIV.

CONGENITAL LARYNGEAL STRIDOR

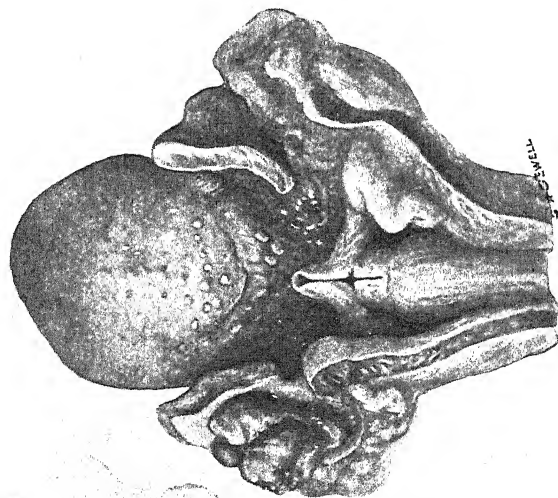


Fig. 1.—Larynx from case of congenital laryngeal stridor. Note cruciform cartilage. (Natural size.)

J. N. W. A. L., 1926

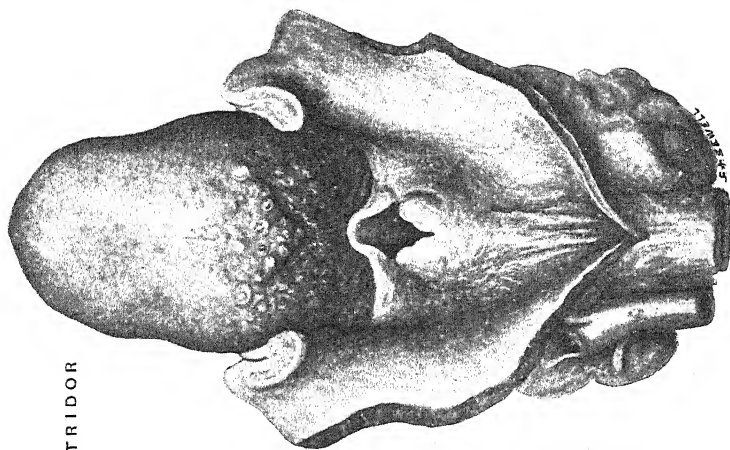


Fig. 2.—Normal larynx of child to compare with Fig. 1. (Natural size.)

By kind permission of Dr. McKenzie and the
Journal of Laryngology and Otology.

Progress is often too rapid, and extensive lacerations may occur; but this difficulty is easily overcome by removal of the binder. The writer points out the risks and disadvantages of pituitary extract, and contrasts its action with that of the mechanical help provided by the binder.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1924, Sept. 6, 753.

LARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Carcinoma: Radium Treatment.—The chief technical difficulty in employing radium for new growths of the larynx has been in applying and maintaining the radium in contact with the growth. Obvious difficulties are met with in carrying this out through the natural passages. Splitting the larynx by an open operation permits an accurate placing of the radium; but the introduction of sepsis, owing to the necessity of keeping the wound open, has been a serious drawback. Escat and Laval¹ have now designed a method which, to some extent, avoids these drawbacks. Under local anaesthesia, after a preliminary tracheotomy, through an external incision enough of the thyroid cartilage is removed to permit of the radium tube being inserted between the soft tissues and the cartilage. It is left in position for seven days. They quote a case of apparent cure by this method, and emphasize the simplicity of the operation under local anaesthesia, and the freedom from sepsis obtained by avoiding the opening of the laryngeal mucosa. W. M. Newcourt² has also tried to avoid the drawbacks of the introduction of a radium tube into the larynx or the embedding of radium in the growth itself, by employing the 'crossfire' method through the skin of the neck. The chief difficulty is to avoid a dermatitis, and this is attained by moving the small capsule of 50 mgrm., screened by 1 mm. of lead and 1 cm. of wood, from position to position on the side of the neck. A case is quoted in which the treatment consisted in applications in eleven different positions, each of two hours' duration, thus giving a total of twenty-two hours. A slight reaction, consisting of dryness in the throat, occurs a few days afterwards. Treatment may be repeated in six weeks' time, as indicated.

Cartilaginous Tumours of the Larynx.—StClair Thomson³ records two cases of this condition in which the growths were successfully removed by laryngofissure. Cartilaginous tumours of the larynx are very rare. They are chiefly subglottic, and this adds considerably to the difficulties of diagnosis. Although pathologically innocent, they may recur and simulate malignant new growths. The condition may also be mistaken for syphilis or tuberculosis. A deficient mobility of the vocal cord may occur with cartilaginous tumours, so that this symptom is not necessarily characteristic of a malignant growth. (*Plate XXIII, A.*) StClair Thomson also relates a case in which the converse occurred, i.e., a subglottic epithelioma was regarded both before and at the operation as a cartilaginous tumour. It presented both a solid sensation on touching with a probe, and the 'raw potato' appearance on section, supposed to be characteristic of a cartilaginous growth. Cases typically present themselves with a history of hoarseness and stridor, slowly increasing over a number of years. Attacks of acute respiratory distress may occur, probably owing to a superadded inflammatory swelling. In one of the cases here illustrated, the slow growth of the tumour was observed for a period of eight years (*Plate XXXIII, B.*) *Fig. C* shows a tumour in the inter-arytenoid space.

Irwin Moore⁴ has made an extended study of all the recorded cases of cartilaginous tumours in the larynx. His conclusions are that these tumours are usually solitary and sessile, and of very slow development. They are only found in adult life, and are more common in males than in females. Hoarseness is usually the earliest symptom; the dyspnoea, when present, is at first

only on exertion, and glottic spasm may cause sudden death. Occasionally dysphagia results from projection of the tumour into the food-passages. Removal by laryngofissure is usually the most suitable method of treatment.

Singers' Nodes.—Andrew Wylie⁵ reviews this subject as a result of over thirty years' experience. Teachers' or singers' nodes may be defined as definite symmetrical thickenings at the junction of the anterior and middle thirds of the vocal cords. For a period a node may be present on one cord only, but one invariably develops later at a corresponding point on the opposite cord. The symptoms are gradually increasing attacks of huskiness, with a feeling of stiffness entailing extra effort when singing or talking. Cough is usually absent, and in the later stages hoarseness becomes constant. The typical appearances usually render diagnosis easy, but difficulties may arise in the rare case of a unilateral node. The application of cocaine is a useful prognostic measure. Should the node shrink appreciably, it indicates that it is recent and soft, and the probability of its disappearance under treatment is good. The contrary means a hard fibrous node. He is of the opinion that too much importance has been attributed to some of these nodes as factors in vocal shortcomings. They may frequently be observed in patients without symptoms, and, if symptoms are present, these may disappear under treatment although the nodes persist. Some nodes undoubtedly begin in early life. Treatment should be based on whether the nodes are recent and fleshy, or old and fibrous. Recent ones may disappear with **Voice Rest** or one application of the **Galvanocautery**. Old-established ones must be removed by cutting forceps; but the results of this operation are frequently disappointing.

Congenital Laryngeal Stridor with Dysphagia.—Congenital laryngeal stridor was referred to in the *MEDICAL ANNUAL* of 1925, p. 432. Dan McKenzie⁶ calls attention to dysphagia associated with congenital laryngeal stridor. This association he observed in a three-years-old child, in whom stridor had been present from within a few weeks of birth. Direct examination of the larynx showed a laryngeal picture as in the illustration (*Plate XXXIV*). Owing to the degree of stridor, tracheotomy was performed, but food was found to pass into the trachea, with a resulting bronchopneumonia, and death four weeks after the tracheotomy. The post-mortem showed no fistula between the œsophagus and trachea, but the typical laryngeal appearances of congenital stridor. The stridor in these cases, he suggests, is due to a weakness of the muscles in the vestibule of the larynx allowing the framework to be sucked inwards during inspiration. The child had had difficulty in swallowing fluids, which occasioned coughing for a considerable period, and this, he suggests, was due to an inefficient closure of the larynx during swallowing. He points out that dysphagia in association with congenital laryngeal stridor has been described by Ashby, and he suggests that it is possible that it is a more frequent occurrence than the records show. [I think this is quite a probable supposition, as, since having my attention called to this possibility, I have observed a case of typical congenital stridor with quite a considerable degree of difficulty in swallowing. The death in McKenzie's case he attributes to the fact that after the tracheotomy the patient could no longer cough up fluid which had entered the larynx, and he considers that tracheotomy should be avoided, if possible, in such cases.—A. J. M. W.]

Fracture of the Larynx.—This not very common injury has been fully dealt with by T. F. Mullen, of Idaho.⁷ Although the cases recorded are few, fractures of minor degree are probably not uncommon and remain undiagnosed. The thyroid cartilage is the one usually involved, the most common method of production being by compression of the anterior angle of this cartilage. Fractures of the cricoid and multiple fractures are usually accompanied by

severe injury to adjacent structures. The fractures may be associated with hæmorrhage, abscess formation, or necrosis of cartilage. The symptoms are pain on swallowing, tenderness, and swelling, usually accompanied by hoarseness and dyspnoea, which may be extreme in degree. Examination of the larynx reveals either a pale œdema or swelling, with hæmorrhages, particularly of the ventricular bands. A late œdema some time after injury sometimes takes place. In the recorded cases death took place in from 70 to 80 per cent of cases. Hoarseness persists for a long period, or may even be permanent.

TREATMENT.—**Silence**, and **Abstinence from Food**, with **Rectal Feeding**, are advisable. Dyspnoea may require an early **Tracheotomy**. Two cases are described in which the larynx was opened through an external incision and the fragments were replaced and the lacerations sutured, with a good result in both cases. Extensive references to the literature are given.

Vocal Cord Paralysis.—Attention is drawn by W. G. Howarth⁸ to the undoubted fact that paralysis of a vocal cord, resulting from injury to the recurrent laryngeal nerve during operations on the thyroid gland, is much more frequent than is commonly supposed. The paralysis is frequently overlooked because it causes no other symptoms than a slight huskiness after operation. This huskiness may not persist for more than a week, the other cord quickly compensating by overaction. The anatomical conditions account for the frequency of this surgical accident, the recurrent laryngeal nerve breaking up into a number of branches about an inch before it reaches the larynx. Of these, the main muscular branch enters the larynx by piercing the inferior constrictor just behind the articulation of the inferior cornu of the thyroid with the cricoid. When the lateral lobe of the thyroid gland is handled during operation, the branches of the nerve are pulled upon, and probably in some cases the muscular branch is stretched round the inferior cornu of the thyroid cartilage. The paralysis seldom, if ever, results from direct injury to the trunk of the nerve. The fact that the branches of the inferior thyroid artery run mainly with the nerve filaments, renders the latter liable to damage as the vessels are dealt with. This nerve is unusually vulnerable, even to slight stretching, and although the majority of paralyses recover, many do not. As far as traumatic cases of unilateral vocal cord paralysis are concerned, T. J. Collett,⁹ as a result of a study of 25 war cases, concludes that the paralysis in these cases is more often due to a lesion of the vagus than to one of the recurrent laryngeal nerve. He finds that a lesion of the vagus on either side is followed by cardiac disturbances, of which the most frequent are tachycardia and arrhythmia. He regards the presence or absence of cardiovascular disturbances as an important diagnostic sign between injuries of the vagus and recurrent laryngeal nerves respectively.

Attention was drawn in the **MEDICAL ANNUAL**, 1924, p. 254, to various operative measures which have been employed with the object of removing the stenosis resulting from bilateral vocal cord paralysis. Considerable research is now being carried out as to the possibility of restoring movement to a paralysed vocal cord by a **Nerve Anastomosis**. L. Colledge,¹⁰ on the purely experimental side, has tried the effect on animals of anastomosing the divided recurrent laryngeal to vagus, descendens noni, and phrenic, respectively. The last of the three was found to be the most effective, in three of the four animals experimented on, spontaneous movement of the paralysed cord returning a few months after operation. As far as work on human subjects is concerned, C. H. Frazier¹¹ reported 2 cases in which some evidence of return of function was shown some months after anastomosing the recurrent laryngeal and the descendens noni. Encouraged by these cases, he has operated upon 6 more, and in 3 of these function is already returning, while the other 3 are

too recent to judge of the result. The cases were traumatic, being due in the majority to operation on the thyroid gland. He emphasizes the importance of a careful selection of cases. There must be some muscular tissue remaining, and the crico-arytenoid joint must be movable. The latter point can be ascertained by movement of the arytenoid with forceps through the direct laryngoscope. Another essential factor for success is that sufficient stump of nerve must remain to permit of the anastomosis. The operation, which must at present be regarded as experimental, might be performed either to improve the airway or to restore the voice.

Temporary or Permanent Tracheofistulization.—A clinical method with the above title has been elaborated by Georges Rosenthal¹² during the last twenty years. The technique consists in a direct puncture into the air-passages, either above or below the cricoid, with curved needles or cannulae. The needle is employed where a single injection is made, and a cannula where prolonged treatment is desired (*Fig. 33*); and the latter method might be described as a tracheotomy in miniature, which does not, however, stop the voice or

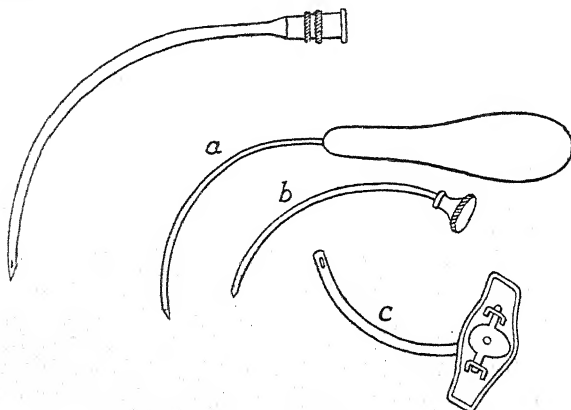


Fig. 33.—Rosenthal's instruments for tracheofistulization. The needle is shown above, and below are (a) the trocar, (b) mandrin, and (c) cannula. (*Re-drawn from 'La Presse médicale'.*)

prevent breathing through the mouth. Two guiding principles governing the method are: (1) The substitution of a curved needle for a straight one for injections through the cricothyroid membrane; (2) A tracheotomy in miniature in cases of pulmonary tuberculosis permits direct intratracheal injections but avoids the disadvantages of a simple tracheotomy. The instruments consist of curved needles and fine trocars and cannulae mounted on movable plates like a Parker's tracheotomy tube. The size of either ranges from 9 or 10 mm. to the smallest-sized infants' tracheal cannula. The operation can be carried out under local anæsthesia with novocain. The suggested indications for this method are: (1) The injection of opaque solutions such as lipiodol for X-ray examination; (2) Intrapulmonary injections of nucleinate of soda in diffuse pulmonary lesions; (3) The injection of vaso-constrictors in hæmoptysis; (4) The treatment of asphyxia from CO, etc., by the insufflation of oxygen; (5) The treatment of laryngeal tuberculosis by intratracheal injections; (6) The treatment of bronchiectasis and gangrene of the lung, etc.

Tuberculosis of the Larynx.—StClair Thomson¹³ relates his experience in

the observation and treatment of cases of laryngeal tuberculosis at Midhurst Sanatorium over a period of ten years. A total of 477 cases were observed among 2541 patients with pulmonary lesions. In the earlier period, 1 case in 4 had laryngeal involvement, but this proportion dropped later. Suggestive symptoms are slight huskiness and discomfort in the throat, or even pain on swallowing. Involvement of the larynx may occur, however, without either of these symptoms, this being the case in 57 of the total number. In regard to sex incidence, his figures show that, when both sexes are exposed to the same conditions, woman is just as susceptible to tubercle of the larynx or lungs as man, perhaps more so. The favourite site is the interarytenoid region, the vocal cords coming second, while the epiglottis is usually involved late.

Results of Treatment.—No less than 25 per cent have been cured in 119 cases. The probable favourable factors in these results have been sanatorium régime and the prompt use of one of the three chief methods of local treatment, namely **Whispers, Silence, and the Galvanocautery**. It is difficult to carry out the two former except in a sanatorium, and their use has always preceded the use of the cautery. Fifty cases were cured by the whisper. Complete silence resulted in cure in 23, and the galvanocautery yielded 46 cures. Doubtless the good results with the cautery were obtained because the cases were carefully selected, after being watched for a long period under whispering or silence. One case had as long as fourteen months' preliminary treatment. As to the durability of the results, of 119 cases in which healing took place, 69 are alive for from two to ten years afterwards; 50 are dead, and they died as a rule with a healed larynx. Thus, as is not generally recognized, improvement very commonly does persist in the larynx while the pulmonary lesion advances. The reverse has not been observed, and of course, most commonly, larynx and lung improve or get worse together.

Principles of Success in Treatment.—Sanatorium treatment is of very great importance. The chief local requirement is voice rest. Local surgical methods have all been abandoned as useless and frequently harmful, apart from the galvanocautery, which has superseded all such measures as curetting, injections, insufflations, or the applications of caustics. No case has been observed in which it did harm.

In November, 1924, StClair Thomson suggested the more frequent use of **Tracheotomy** in cases of tubercle of the larynx. As a result of this, the subject was discussed at the summer meeting of the Section of Laryngology of the Royal Society of Medicine. Ritchie Rodger¹⁴ related four cases in which tracheotomy was required for urgent dyspnoea. StClair Thomson stated that of 450 cases of tubercle of the larynx, he had only had to do tracheotomy on two or three occasions. He considered it rarely necessary, but when it was, the results were good. Disadvantages are the infection of the wound and the difficulty in getting rid of expectoration. General opinion was that it should be reserved for cases in which respiratory obstruction is pronounced.

Karl Beck¹⁵ has found **X-ray Treatment** of value in cases of laryngeal tuberculosis, combined with other methods of treatment. He has employed the method in some hundreds of cases, but does not lay down any decided indications as to the most suitable ones. He aims at producing a mild reaction. Owing to the protracted effect of radiation, the dosage should be increased very cautiously. The usual course is a series of five to six exposures at intervals of from four to six weeks. The dosage is commonly given from two fields, employing a 3-mm. aluminium filter, and giving $\frac{2}{3}$ H.E.D. ($\frac{1}{3}$ in each field) in from one to two sittings.

Laryngeal Tuberculosis in Children.—C. D. S. Agassiz¹⁶ reports 11 cases of this uncommon condition in children under 16 years of age. All cases suffered

from pulmonary tuberculosis, and bacilli were present in the sputum of all but one. Ages varied from 10 to 16 years, and the sexes were about equally divided. The absence of marked symptoms pointing to the larynx was very conspicuous. In the majority, some huskiness was the only symptom noticed, and in others the laryngeal lesion was only discovered as a result of routine examination. Dysphagia and laryngeal cough were not noted. As a rule the lesions are not extensive, some swelling and redness of the arytenoids, with or without deposits or ulceration of the cords, being most frequently observed. The essential points that seem to emerge from this article are that tuberculosis of the larynx is not as uncommon in children as is generally supposed, and that when it occurs it is less rapidly progressive and produces less symptoms than in adults.

REFERENCES.—¹*Ann. des Mal. de l'Oreille*, 1924, Feb.; ²*The Surgical Clinics of North America*, 1924, Feb.; ³*Jour. Laryngol. and Otol.* 1925, Jan., 1; ⁴*Ibid.* Jan., 9; Feb., 84; March, 145; ⁵*Ibid.* 1924, Aug., 445; ⁶*Ibid.* 1925, May, 285; ⁷*Ann. of Surg.* 1924, lxxx, Dec., 660; ⁸*Brit. Med. Jour.* 1924, i, 465; ⁹*Arch. Internationales*, 1924, May; ¹⁰*Brit. Med. Jour.* 1925, i, 547; ¹¹*Jour. Amer. Med. Assoc.* 1924, Nov. 22, 1637; ¹²*Presse méd.* 1924, Aug. 20, 691; ¹³*Brit. Med. Jour.* 1924, ii, 841; ¹⁴*Lancet*, 1925, i, 1242; ¹⁵*Munch. med. Woch.* 1923, Dec. 7, 1454; ¹⁶*Jour. Laryngol. and Otol.* 1924, Nov., 628.

LATHYRISM.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

L. A. P. Anderson, A. Howard, and J. L. Simonsen¹ record very instructive investigations on the relation of khesari dal, *Lathyrus sativus*, to this disease, with which it has for so long been associated. They found that the seeds of this leguminous crop are never grown and marketed in a pure state, but are always mixed with those of akta, *Vicia sativa*, which cannot completely be separated from the khesari by commercial methods, so in times of scarcity both grains are consumed together with occasional other ones. They therefore grew each pure, and found that while the khesari dal contained no alkaloids, divicine and vicine can be obtained from akta seed; in accordance with this, they found that both ducks and monkeys thrived, and the former got fat, on khesari dal, while if from 25 to 50 per cent of akta seed was added, both ducks and monkeys developed nervous symptoms which might prove fatal to them. Experiments with the pure alkaloids showed divicine to be the most active poison, the ducks showing signs somewhat like beri-beri in pigeons, although vitamins were supplied in some of the tests; while the monkeys had occasional convulsive seizures, although their symptoms did not resemble those of lathyrism in man. The authors, therefore, are not yet in a position to state definitely that akta is the cause of the human disease.

REFERENCE.—¹*Ind. Jour. Med. Research*, 1925, April, 613.

LEIOMYOMA CUTIS.

E. Graham Little, M.P., M.D., F.R.C.P.

O. S. Ormsby¹ collects the previously recorded instances of this very rare disease, and adds two new cases of his own. The first was in a man, age 30, with painless bluish-red and yellowish-red nodules on the extensor surface of the left wrist and forearm, with a history of fifteen years' persistence. Histological examination showed that the bulk of the swelling was made up of muscle fibre. The second case was in an Italian man, age 30, who showed bluish or brownish nodules on the left cheek, five years in duration (*Plate XXXV*). They were painful only when old. Sections showed that the tumours consisted of smooth muscle fibre. Diagnosis is rendered certain only by histological examination. The etiology is entirely unknown.

M. Scholt² reports a case in an American woman, age 46, in whom the condition had started twenty-five years previously. It consisted of reddish nodules occupying the upper half of the extensor surface of the left arm and fore...

PLATE XXXV.

LEIOMYOMA CUTIS



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ranging in size from that of a pinhead to that of a split-pea. There were several hundreds in number, and they were tender upon pressure. On the forearm almost continuous sheets of coalesced nodules were seen. Later they began to appear on the left hand as well. Microscopical examination showed that the nodule was composed of bundles of smooth-muscle fibres. After numerous unsuccessful efforts with radiotherapy (radium and X rays), **Cauterization with pure Trichloroacetic Acid** proved eminently successful.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1925, April, 466; ²*Ibid.* 1924, Aug., 173.

LEISHMANIASIS. (See KALA-AZAR.)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

In the Croonian Lectures Rogers¹ summarizes the distribution, epidemiology and communicability, prophylaxis, and treatment of leprosy, emphasizing the low infectivity, usually after prolonged close contact; the infrequent infectivity of nerve cases, making it unnecessary to isolate many of them; the high susceptibility of young people; and the good results of the modern treatment in early cases, enabling the problem of reducing the disease to small proportions to be tackled with good hope of success within a very few decades.

J. A. Mitchell² has reorganized leprosy prophylaxis in South Africa in accordance with recent advances, under the control of a board of medical experts, who have already released 597 cases, mostly anaesthetic, or 28 per cent of the total, as uninfected; while arrangements are being made for the treatment of early cases and for the gradual conversion of leper institutions into 'leper sanatoria'; also for further research; admirable measures which should be followed in all British Possessions.

E. Muir³ compares the leprosy problem in India with the lesser one in the Philippines as the result of a visit to the latter, and states his belief that in view of the stationary numbers in India the measures now available would result in the entire disappearance of the disease within a few generations; he advocates the special training of all medical students regarding the disease, and the appointment of leprosy experts in all the Indian provinces, with control of numerous leper clinics and one or more colonies, together with further research. He points out that under Philippine laws nothing can be done for the early uninfected lepers, whom it is most important to treat, although very valuable pathological research work is being done at Cullion by Dr. Wade and his colleagues.

H. C. de Souza-Araujo⁴ deals with the leprosy problem in Brazil, where over 10,000 lepers are known, and he estimates the true number at 24,000. It was not until the appointment of a leprosy board in 1921 that active steps were taken to deal with the problem, and in 1923 excellent regulations were passed. Figures of the State incidence are given, and the construction of ten large leprosaria in the form of agricultural colonies is advocated, which with the present Government grants will take fifteen years. Compulsory notification, segregation, the separation of healthy children born to leper patients, and the isolation of uninfected nerve cases at home, are all provided for in the laws, as well as the return of all alien leper-immigrants.

CLINICAL.—E. Muir⁵ emphasizes the great part played by predisposing causes in leading to the development of leprosy, including febrile diseases, pregnancy, puberty or the climacteric, syphilis, chronic bowel affections, protozoal infections such as malaria and kala-azar and hookworm disease, which should all be sought for and removed if possible in order to obtain the best results from treatment. On the other hand, in the advanced stages of leprosy, after the curve has begun to descend, he has seen the disease resolve and even

disappear after the onset of a specific disease such as kala-azar, dengue, malaria, cholera, and dysentery.

E. V. Pineda⁶ analyses 300 Cúlion post-mortems in lepers since March, 1922, the main cause of death having been tuberculosis in 24 per cent, nephritis in 16.3 per cent, bronchopneumonia in 9.3 per cent, dilated heart in 7.6 per cent, malaria in 5.6 per cent, endocarditis in 5 per cent, amœbiasis in 3.3 per cent, and lobar pneumonia in 3 per cent, while leprosy itself only caused 2.3 per cent. Chaulmoogra ethyl esters were found to be injurious in one-third of the tuberculous cases, and also to induce albuminuria and nephritis of the parenchymatous form, but no lepra bacilli were found in the kidneys.

J. M. H. McLeod⁷ records three contact cases of leprosy in the British Isles: one from a conjugal nodular case, who had taken no precautions; a boy of 15, who had slept with his nodular leprous brother for five years; and a boy of 12 who contracted the disease in Ireland from his father, a poor Russian with advanced nodular leprosy: two at least having slept with a nodular leper before becoming infected, as in the case recorded by Benson in Dublin in 1877.

J. A. Fordyce and F. Wise⁸ give a well-illustrated account of leprosy as seen in New York, which will be useful to those with little experience of the disease.

TREATMENT.—E. Muir and his assistants⁹ point out that *Hydnocarpus wightiana*, growing wild over much of Southern India, easily and cheaply obtained in unadulterated form, and fruiting at most seasons, yields an oil at least as effective in leprosy as that of the sparsely distributed *Taraktogenos kurzii*, which fruits in the rainy season when the forests are practically inaccessible. In Calcutta the esters are made solely from the former oil by a simple and cheap process described in detail in this paper, and not requiring distillation or the use of the expensive ether. If the *Hydnocarpus wightiana* is grown in all leprous tropical countries, every leper institution could make its own esters at very little cost. The *Hydnocarpus* Esters may be safely sterilized by the addition of 1 per cent iodine or 4 per cent creosote, while the reaction at the site of subcutaneous or intramuscular injections is greatly reduced by the addition of equal parts of olive oil. The dose of this mixture is increased by 0.5 c.c. at each bi-weekly dose from 0.5 up to 10 c.c., and continued until all lesions, except permanent nerve ones, have disappeared, and repeated negative bacteriological examinations have been obtained. Failures are due to want of persistence and attention to diet and hygiene, or the selection of unsuitable cases with permanent incurable nerve-destruction lesions.

J. Rodriguez¹⁰ records the fourth six-monthly report on the treatment of 2810 advanced lepers at Cúlion up to March, 1924, with 9.2 per cent clinically and bacteriologically negative (the 273 negative cases not including 40 paroled or discharged), 62.5 per cent improved, 15.6 per cent stationary, and 12.6 per cent worse. The best results were obtained with Chaulmoogra Ethyl Esters with 0.5 per cent iodine; 77.3 per cent were greatly or slightly improved, the iodine so much lessening the local irritation that the plain esters without it had been given up; the dose of the iodized esters was 2 to 5 c.c. once a week intramuscularly. Cases of under five and over twenty years' duration did best, and the results improved with the duration of the treatment up to thirty-two months. Lepra reactions in the form of fever are regarded as evidence of lessened bodily resistance, so are to be avoided.

H. W. Wade, C. B. Lara, and C. Nicolas¹¹ deal with the complaints of patients under chaulmoogra esters treatment which influence the dosage, in over 2000 cases. Unimportant temporary immediate symptoms, such as coughing and dizziness, were met with in 6.4 per cent; local inflammatory effects in 21.3 per cent, but only 9 had abscesses; headache, malaise, and

simple fever were seen in 6.0, 6.4, and 9.3 per cent respectively; chest pain and cough in 15.0 and 19.1 per cent; lepra fever or cutaneous eruptions in 14.3 per cent. The writers are doubtful if it is advisable to produce such reactions or not, but are inclined to consider them unnecessary and perhaps harmful.

A valuable series of papers have appeared in the *China Medical Journal*¹² confirming the value of the improved treatment by injections of chaulmoogra oil and their derivatives, H. Fowler and B. E. Read in China, and H. R. O'Brien in Siam, using esters made from *Hydnocarpus anthelmintica* oil of those countries, and E. Muir with *Hydnocarpus wightiana* oil of South India, both being much cheaper and purer than the Burma *Taraktogenos* oil. Muir also reports that the *H. wightiana* oil from ripe seed is so pure that it can be injected, with 4 per cent creosote to sterilize it, subcutaneously by his method of infiltrating it beneath the skin lesions, in doses gradually increasing to even 24 c.c. at a time weekly; the results so far are not inferior, and may be superior, to those following the use of the ethyl esters, which cost about ten times as much; while the injections are practically painless and much preferred by the patients. If further experience confirms this opinion, another very important advance will accrue. [Smith, Stanistreet & Co., Calcutta, can supply the creosoted *Hydnocarpus wightiana* oil at a very low cost, about five shillings a pound.—L. R.]

Isabel Kerr¹³ records 4½ years' experience of chaulmoogra esters in the Dichpalli Leper Hospital; 180 cases treated in 1923-24 showed "17 per cent become symptom-free; 45 per cent very much improved, most of them likely to become symptom-free; 35 per cent improved; 3 per cent dead or worse. Of the infective cases, 63 per cent have become uninfected". She now prefers pure esters, with 4 per cent creosote or 1 per cent iodine, injected subcutaneously by Muir's infiltration method in weekly doses, increasing to the patient's tolerance limit, up to 16 c.c. having been given.

Norman Walker¹⁴ reports an advanced nodular case in which considerable improvement followed within two months of the injection of Vaccine, made by Glen Liston by heating carbol-saline emulsion of an excised nodule, containing 200 million bacilli per c.c., to 60° C. for half an hour. From 0.1- to 1-c.c. doses were given, the nodules showing great diminution and disintegration of the bacilli, the improvement with this treatment being said to be greater than in other recorded cases.

F. Rho¹⁵ has tried in leprosy Cupric and Cyanocupric Preparations made by him, as the Japanese advocates of this treatment had not revealed their methods of making them. In Sicily and Sardinia 20 leprosy cases were treated intravenously with cuprocyan, consisting of a double cyanide of copper and potassium, 5 to 10 c.c. of a 2 per cent solution being injected slowly every five to seven days. It may be continued for months with occasional intervals. Improvement was noticed after ten injections in almost all the cases, and he suggests its use in combination with chaulmoogrates.

REFERENCES.—¹*Ann. of Trop. Med. and Parasitol.* 1924, Oct. 31; ²*S. Afric. Med. Record*, 1924, Nov. 22, 529; ³*Ind. Med. Gaz.* 1925, June, 261; ⁴*Amer. Jour. Trop. Med.* 1925, May 29, 219; ⁵*Lancet*, 1925, i, 169; ⁶*Jour. Philippine Islands Med. Assoc.* 1924, May, 169; ⁷*Brit. Med. Jour.* 1925, i, 107; ⁸*Arch. of Dermatol. and Syph.* 1925, Jan., 1; ⁹*Ind. Jour. Med. Research*, 1924, Oct., 221; ¹⁰*Jour. Philippine Islands Med. Assoc.* 1925, Feb., 40; ¹¹*Philippine Jour. Sci.* 1924, Dec., 661; ¹²*China Med. Jour.* 1925, July, 575-631; ¹³*Lancet*, 1925, Aug. 22, 373; ¹⁴*Ibid.* 1924, Sept. 13, 542; ¹⁵*Jour. Trop. Med. and Hyg.* 1924, Dec. 1, 315.

LEUKÆMIA, ACUTE. (See EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

LEUKÆMIA CUTIS.*E. Graham Little, M.P., M.D., F.R.C.P.*

Universal Leukæmia Cutis.—H. L. Keim¹ reports a case of lymphatic leukæmia with a generalized skin eruption in a man, age 56, in whom the skin had become affected, six years previously, with an extremely itchy, papular, and vesicular eruption, which proved completely intractable to all the treatment tried. When seen by the author, there was a scaly dermatitis, with dull-red discoloration over the whole body. The skin was thickened and oedematous, with very diffuse infiltration, but there was no weeping. On the feet and legs there were confluent masses of papillomatous lesions, individually of the size of a glass-headed pin. The same lesions were found upon the dorsal surface of the fingers, and the hands and wrists. There was marked dyskeratosis of the nails, which were thickened, and tending to separate from the nail-bed. Hair was almost completely absent from the beard, axillæ, pubis, and body, and was very thin on the eyebrows, eyelashes, and scalp. Neither spleen nor liver could be felt, but there was general enlargement of glands, varying in size from that of an olive to that of a small orange, the largest being found in the groin. A blood-count showed: red blood-corpuscles, 4,350,000; leucocytes, 30,500. A section of the skin showed lymphocytic infiltration of the corium. The treatment adopted comprised X-ray exposure, wet dressings, and various ointments, together with the administration of arsenic. The leucocytosis, at one time, reached 85,000, the red blood-corpuscles remaining constant. The papillomatous lesions were uninfluenced by X rays, and were best treated by *Salicylic Acid Plaster*. The patient died, probably, of bronchopneumonia, and post-mortem changes were typical of lymphatic leukæmia.

Myeloid Leukemia Cutis.—J. L. Tenenbaum² records a new case of myelogenous leukemia with skin manifestations, an extremely rare condition. The patient was a native of Russia, age 60. Six weeks before being seen he had developed bluish 'spots', which rapidly grew in number, and covered a large part of his body. The patient was treated with deep X Rays for the spleen, and for some of the skin tumours, and received injections of *Sodium Cacodylate* every other day. Under this treatment the spleen diminished in size, and some of the skin lesions involuted; but others appeared. He passed from Tenenbaum's observation, and died a few months later.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1924, Nov., 579; ²*Ibid.* 551.

LEUKÆMIA, LYMPHATIC.*Ivor J. Davies, M.D.*

G. B. Minot and R. Isaacs,¹ of Boston, present a report on lymphatic leukemia, its age incidence, duration, and the benefit derived from *Irradiation*. Their analysis is summarized as follows:—

1. Data are presented concerning 98 cases of chronic lymphatic leukemia and 57 of the acute form of the disease. End-results have been studied especially from 80 cases of the chronic form over thirty years of age; 50 were treated by intensive irradiation from radium or Röntgen rays, 30 were not. The latter serve as a control group to the former.

2. The decade in life in which the most cases of chronic lymphatic leukemia occur is 45 to 55. Acute lymphatic leukemia seldom occurs after the age of 25.

3. Both chronic and acute lymphatic leukemia affect males about three times as often as females. Both forms of the disease are relatively more frequent in females in the earlier than the subsequent years of life.

4. The correct diagnosis of the chronic cases was not established on the average until 1.4 years after the first symptoms, though on the average a physician was consulted 0.55 years earlier. On the average, the nature of the acute cases was not recognized by the physician until the disease had run two-thirds of its course.

5. Irradiation had no detectable effect on prolonging the duration of either form of the disease. The average duration of life, after the first symptom, of 80 chronic cases, over 30 years of age, was 3.45 years, being essentially the same for the 50 irradiated and the 30 that were not. The chronic disease lasts a shorter time in younger than older persons. About 60 per cent of all chronic cases live one to four years, and 14 per cent six to eight years. About 50 per cent of the acute cases died in less than two months after initial symptoms.

6. There was a great similarity in the time the different patients first received irradiation as related to the total duration of their disease, indicating that if the disease was destined to be long the patients had insidious symptoms for a longer time than those fated to a short course. The early institution of irradiation as yet does not promise a more favourable prognosis with respect to life extension.

7. Irradiation, properly administered, undoubtedly benefits symptomatically cases of the chronic form, although not to the extent that occurs in chronic myelogenous leukaemia.

8. The beneficial effects of irradiation in acute lymphatic leukaemia are but evanescent and slight.

9. Irradiation may induce a better production of the three formed elements of the marrow and lessen the activity of the formation of lymphocytic cells. The hæmoglobin level, numbers of blood platelets, and character of the lymphocytes serve more importantly to adjudge the patient's condition than the number of white cells. An aleukaemic blood may occur when patients are seriously ill.

10. The effect of irradiation on decreasing the size of lymph nodes or spleen in chronic lymphatic leukaemia is apt to be proportional to the amount of improvement in the patient's general sense of well-being.

11. Treatment should be guided and prognosis formulated from correlated information obtained from the patient's history and physical signs, together with complete blood examinations and basal metabolic rate determinations. By so doing, in spite of irradiation becoming less and less effective and the patient's comfort decreasing as the disease progresses, this therapy is of distinct value and maintains the patient's efficiency usually much better than if no irradiation is given.

12. The knowledge of to-day and the new irradiation methods probably will permit still greater benefits from irradiation in chronic leukaemia than in the past ten years.

REFERENCE.—¹*Boston Med. and Surg. Jour.* 1924, July 3, 1.

LIGATURE NEEDLE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

H. S. Souttar¹ has designed a new form of ligature needle which he finds useful for tying up omentum or similar structures (*Fig.* 34). He describes the use of it as follows: "It occurred to me that a good deal of time might be saved if the use of the aneurysm needle could be altogether avoided. I



Fig. 34.—Souttar's ligature needle for tying omentum or similar structures.

therefore devised the instrument illustrated. It has a broad blade with one deep groove, and across the end a transverse hole through which the ligature is passed. The two ends of the ligature can be kept entirely separate as the threaded needle is passed through the omentum. An assistant cuts the ligature

and ties one side, while the surgeon ties the other and cuts the omentum between. The breadth of the instrument might at first sight appear clumsy, but as a matter of fact it enables the operation to be carried through with a neatness and dexterity impossible with the ordinary methods. The tissues are not torn but are gently spread apart, with the result that the whole proceeding is carried out in full view, while an adequate stump ensures a remarkable security for the ligatures. I have now been using the instrument for nearly a year, and I am very much taken with its convenience. In such operations as gastrectomy and colectomy the saving of time and the added clearness of operative technique are quite remarkable."

The writer has used this instrument and can vouch for the opinions expressed by the inventor. A lighter needle of the same kind and more curved at the end has been made at his suggestion for use in goitre operations.

REFERENCE.—*Surg. Gynecol. and Obst.* 1925, April, 565.

LINITIS PLASTICA.

Robert Hutchison, M.D. F.R.C.P.

This subject was last reviewed in the *ANNUALS* of 1913 and 1914. Lyons¹ has now published an account of it based on 38 cases observed at the Mayo Clinic. He is of the opinion that the term 'linitis plastica' should be limited to cases of diffuse small-cell carcinoma, which was present in 80 per cent of the specimens he examined. Other conditions giving rise to the leather-bottle stomach are simple ulcer, syphilis, muscular hypertrophy, adenocarcinoma, and colloid carcinoma—hence the differences of opinion as to the benign or malignant character of the disease. The symptoms are the same as those of gastric carcinoma, and linitis cannot be diagnosed by the X rays. The localized form cannot be differentiated from cancer, and in the generalized form the picture is the same as in scirrhus cancer. The lesion may be localized or involve the whole stomach, the generalized form being the late stage of the local lesion.

The involved portion of the wall of the stomach is characterized by marked thickening and loss of flexibility. On palpation it feels gristly. The peritoneum over the lesion is not transparent and glistening as normally, but pearly white. If the process is still localized and is in the pyloric region, where most of the lesions start, it may result in obstruction, with dilatation of the part of the stomach proximal to the obstruction. When the process has spread so as to become generalized, the stomach usually is contracted and converted into a rigid tube. Even in the generalized form the greatest thickness and rigidity is usually near the pylorus, and the cardia is the least involved. The lesion does not end abruptly at any stage, but passes gradually over into the normal stomach.

On cutting through the thickened wall of the stomach, the different coats are clearly discernible; but even though the coats can readily be differentiated, they do not offer the same contrast as under normal conditions. The submucosa may be increased ten to twenty times its normal thickness, the subserosa and serosa seven to ten times, the muscular coat five to eight times, and the mucosa two to three times. The mucosa sometimes is wrinkled, being thrown into quite heavy rugæ. This is probably due to contraction in the other coats. Glandular involvement is relatively as common as in other cases of gastric carcinoma. In the 23 cases there were 15 with glandular involvement.

The presence or absence of ulceration could be determined only in cases in which resection was performed. Ulceration was present in 5 cases. This is in marked contrast with the findings of Thomson and Graham, who found ulcer always associated with the condition.

The microscopic picture is characteristic. The mucosa may be practically normal, and is sometimes thrown into rugæ. Degenerative changes in the

cells, and sometimes even ulceration, may be present, resulting most probably from disturbance of the blood-supply by the contracting connective-tissue fibres. This connective tissue is most abundant in the submucosa, and is responsible for the enormous thickening of this coat, but fibres also pass from the submucosa through the muscularis and subserosa to the serosa. These fibres pass in every direction through all the coats, interlacing with each other and surrounding the blood-vessels. The contraction of the fibres around the blood-vessels is responsible for the 'bloodless' stomach which several writers have mentioned.

The muscular elements of the muscularis are markedly hypertrophied and interspersed by the bands of connective tissue extending through from the submucosa. This muscular hypertrophy is hard to explain, but is probably the result of the increased work thrown on the gastric muscle by the deposition of fibrous tissue in the walls of the stomach.

The subserosa is thickened and solidified, because of the presence of the same connective-tissue elements, with resulting obliteration of blood-vessels, which in turn cause the changes in the appearance of the peritoneum, namely, the loss of transparency and glistening appearance.

Scattered throughout all the coats, but most marked in the submucosa, are numbers of small cells with large nuclei. They resemble epithelial cells in all respects. Practically every one writing on linitis plastica has mentioned these cells, but many, while commenting on their similarity to epithelial cells, have believed them to be connective-tissue elements. In some places they are grouped together in large masses, and in others they seem to be advancing in single file through the lymphatics. Mitotic figures are not very numerous. The process probably represents a high-grade malignancy meeting with great resistance on the part of the subject. The cords of cells advancing through the lymphatics of the subserosa aid in the diagnosis of the condition. The involved lymphatics of the subserosa can often be seen through the peritoneal coat as a network of fine white lines. This cannot be said to be characteristic of linitis plastica, as any type of carcinoma or tuberculosis might produce the same condition. But the presence of such a network in a case suspected to be linitis plastica would rule out syphilis or any other inflammatory lesion except tuberculosis. The latter occurs so rarely in the stomach that it need hardly be considered.

END-RESULTS.—Excluding the 5 cases in the series in which microscopic examination revealed a lesion other than small-cell carcinoma, there were 15 explorations, 3 gastro-enterostomies, and 15 resections, with 6 operative deaths, an average mortality of 18 per cent. Of the 27 patients who survived operation, 21 are dead.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1924, July, 34.

LIPS AND FACE, INFECTIONS OF. (*See FACE AND LIPS.*)

LIVER, ABSCESS OF, AMŒBIC. (*See AMŒBIASIS.*)

LIVER, CIRRHOSIS OF.

John H. Anderson, M.D.

Edmund I. Spriggs, M.D., F.R.C.P.

W. J. Mayo¹ summarizes the surgical aspects of hepatic cirrhosis as follows, dividing cirrhosis into portal and biliary:—

In *portal cirrhosis* (where toxic substances enter by portal circulation) there is a deposit of connective tissue round the portal vessels which causes interference with the hepatic circulation. The end-results are ascites and abdominal hemorrhage from mucous membranes, especially of the stomach. The liver

may be small, contracted and nodular, or even enlarged and smooth (due to fat deposit), with all intervening stages. Clinically there are two types. The *gastro-intestinal type* is due to irritating substances in food (alcohol, pepper); the spleen is not enlarged. Here **Omentopexy** (Talma-Morison operation) gives relief; **Splenectomy** in addition may have value, though it adds considerably to the risk. In the *splenic type*, with enlarged spleen, as in late stages of splenic anemia, splenectomy gives excellent results.

Biliary cirrhosis (where toxic substances enter by bile-channels) is almost always the result of infection or obstruction in the gall-bladder or common duct, usually due to gall-stone disease. The liver is enlarged, dark-coloured, often soft, and bleeds easily, but the spleen is not greatly enlarged. Connective tissue is developed round the minute bile-ducts, and causes obstruction, with early and continuous jaundice. Treatment is directed to the gall-bladder and bile-ducts. A second type is seen with no demonstrable disease in the biliary ducts; there is an enlarged, congested, but fairly firm liver, chronic jaundice, and enlarged spleen. **Splenectomy** is sometimes indicated in this type, but must be early.

REFERENCE.—*Ann. of Surg.* 1924, lxxx, 419.

LIVER EFFICIENCY TESTS.

John H. Anderson, M.D.

Edmund I. Spriggs, M.D., F.R.C.P.

Functions of the Liver.—A number of hepatic functions have been discovered since Claude Bernard first described the glycogenic power in 1857. Gruner gives an admirable classification in the *MEDICAL ANNUAL* for 1924.¹ An alternate classification is as follows:—

A. Constructive: (1) Secretion of bile; (2) Formation of glycogen in carbohydrate metabolism; (3) Formation of urea in nitrogen metabolism; (4) Formation of fibrinogen; (5) Formation of antithrombin.

B. Destructive: (6) Destruction of red blood-cells; (7) Detoxication: (a) formation of conjugate sulphates and glucuronates, (b) withdrawal of toxins.

Some of these functions are discussed below, and those bearing on hepatic efficiency tests reviewed.

Only two types of liver-cell need be mentioned: (1) The *polygonal cells* peculiar to the liver. (2) The *reticulo-endothelial cells* (Aschoff), found elsewhere in the body, particularly in the spleen. In the liver they are known as Kupffer's cells and line the vascular capillaries, separated from the bile capillaries by the polygonal cells. The present view of their function is that under certain conditions they take up intact red corpuscles, debris of corpuscles, and free hæmoglobin dissolved in the plasma. Within them hæmoglobin is broken down and bilirubin (the main pigment of the bile) or its precursor is formed. The polygonal cells are concerned with the other hepatic functions.

The liver is an organ of many functions, of which one is localized in one group of cells, and the others are common to all. Gross liver destruction may therefore be present without noticeable loss of function. Animal experiments have shown that death may not occur till 75 per cent of liver substance is removed (Mann), nor jaundice develop till three-quarters of the bile capillaries are blocked.² The liver has great reserve capacity and power of compensatory hyperplasia.¹ If 70 per cent of the liver of a dog is removed, it will be replaced within twelve weeks, not alone by hypertrophy, but by hyperplasia of the remaining liver-cells.³ These powers must be kept in mind when considering tests for hepatic efficiency. (The van den Bergh test is described under **JAUNDICE**, p. 265.)

Urobilin Test.—The chapter on urobilin formation is yet to be written. It is generally accepted that in the intestine some of the stercobilin is reabsorbed,

reaches the liver, and is there built up again into bilirubin. Some passes the liver and is excreted by the kidneys as urobilin, or its precursor urobilinogen. In health this amount is small (1-20),⁴ and special tests are required to show its presence. In liver disease the amount which is not picked out by the hepatic cells increases, accumulates in the blood, and is excreted by the kidney in easily demonstrable amounts. The intestinal origin of urobilin has good support,^{4,5} but Whipple and Hooper⁶ state "there is not a shred of evidence to indicate that stercobilin is ever absorbed from the intestine". Kahn⁷ holds that, in addition to the intestinal origin, "a diseased liver may form urobilin either directly as a product of its cells or indirectly from decomposition of bilirubin within its bile passages". In increased blood destruction also the serum is so overloaded with urobilin from the intestine that even the normal liver is unable to deal with it, and some, being carried past, appears as urobilinuria.

French workers (notably Brulé⁸) hold that the presence or absence of urobilin in the urine depends on the amount of bilirubin in the blood, the kidney threshold being higher for bilirubin than for urobilin. They state that when the amount of bilirubin in the serum reaches its kidney threshold it is excreted unchanged, but when it falls below this point urobilin is again formed by the tissues and excreted as such. So in mild jaundice we get urobilinuria, and in severe, bilirubinuria.

The complete mechanism of urobilin formation is not settled, and, in consequence, the urobilin test must be accepted with reservations as a test of hepatic efficiency, especially as severe nephritis may prevent its excretion even when in excess in the blood.

G. B. Wallace and J. S. Diamond⁴ and Kahn⁷ give various methods of estimation of urobilin—fluorescent, spectroscopic, colorimetric, and by precipitation with ammonium sulphate. G. M. Piersol and H. L. Boekus⁹ consider that it is one of the most reliable of liver tests; a positive test indicates liver damage, but gives no indication as to the degree of deficiency: a negative test is valueless. If the intestinal formation of urobilin is accepted, care must be taken, by examination of the feces, to exclude urobilinuria due to abnormal destruction of blood.

Urobilinuria has been found in the following conditions: hepatic cirrhosis (almost constantly); enlarged liver of alcoholics (later stages); hepatic stasis (especially chronic cardiac jaundice); catarrhal jaundice; pneumonia at time of resolution (probably due to clogging of the liver with resolution products and haemoglobin from the diseased lung); liver abscess in amoebic dysentery; measles, scarlet fever, miliary tuberculosis, and carcinomatosis of the liver; toxic states, such as eclampsia; haemolytic states, such as malaria; pernicious anaemia; sepsis and lead poisoning.

Glycogenic Function.—Carbohydrates are thought to reach the liver mainly as the monosaccharide glucose. Polymerization produces the polysaccharide glycogen which is stored in the liver and liberated when required for use in the body. Lævulose may also be stored in the liver. All the ordinary sugars, except lævulose, give a definite blood-sugar curve after ingestion in normal individuals. When the liver is damaged, as in diabetes or hepatic derangement, lævulose gives a different curve to the normal (see Fig. 35).

In 1899, Sachs reported lowered lævulose tolerance in hepatectomized frogs, and two years later Strauss noticed lævulosuria in cases of hepatic derangement. Strauss examined the urine only, but in 1913 Shirokauer suggested estimation of the blood-sugar as well. Sixty to a hundred grm. of lævulose are given in a glass of water, and the blood-sugar is estimated each quarter of an hour and the urine tested hourly for three hours. Beaumont and Dodds⁵ consider the

result positive if the blood-sugar rises over 0.14 per cent. or 0.03 per cent over the first value. [This test is valuable, but fails to detect small degrees of liver inefficiency. At Ruthin Castle it has given negative results more often than not where liver derangement was thought to be present on clinical evidence.—J. H. A.]

Formation of Urea.—The association between the liver and urea formation has been long known, and recent experimental work tends to show the liver as the sole source in the body. J. L. Bollman, F. C. Mann, and T. B. Magath,¹⁰ working with hepatectomized dogs, conclude that in dogs no measurable amount of urea is formed following hepatectomy up to 34½ hours, and that urea formation is dependent on the presence of the liver. Their work seems conclusive.

No satisfactory clinical application has been made of this action of the liver in estimating hepatic efficiency. Tests have been devised founded on the estimation of the total non-protein nitrogen, urea nitrogen, and amino-acid nitrogen of the blood. Their use in disease is doubtful, as in health wide variations are found.⁷ Kidney disease may also falsify results.

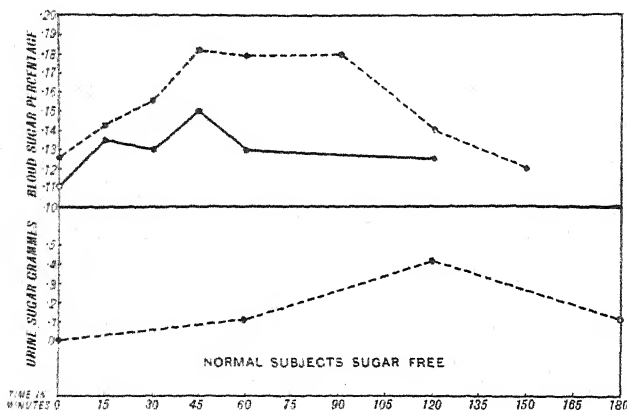


Fig. 25.—Estimation of blood and urine sugar after ingestion of 60 grm. of levulose in five healthy subjects (continuous line) and case of metastases in liver (broken line). (Adapted from paper by C. D. Shapland.)

Formation of Fibrinogen.—It is known that fibrinogen disappears from the blood in hepatectomized animals and is diminished in chloroform and phosphorus poisoning. D. P. Foster and G. H. Whipple¹¹ report a method of estimation, and conclude the liver is the chief, if not the only, source of fibrinogen. The blood content varies greatly in dogs, but in man is more constant, ranging from 385 to 618 mgrm. per 100 c.c. J. S. McLester, M. T. Davidson and B. Frazier¹² have investigated over 200 cases, and find the blood fibrin fairly constant in health (250 to 400 mgrm. per 100 c.c., average about 320 mgrm.). Diseases which stimulate the liver give a high count; those which depress or destroy a large part lead to a low blood fibrin. They give charts for a number of diseases, but consider the test too crude at present for diagnostic use.

Detoxication (Glycuronic Function): The Camphor Test.—Van Dooren and Destree¹³ give 1 gm. of camphor by the mouth, and test the urine by Grimbert-Bernier's method for glycuronic acid. The tint obtained is visible in health,

and red or colourless in liver disease. Three hundred and fifty cases gave constant results.

Detoxication (Withdrawal of Toxins): The Dye Tests.—Many of the tests for hepatic efficiency are founded on the power of the liver to deal with a dye which reaches it by the circulation. If the dye is normally excreted by the liver, damage to the hepatic cells should cause an alteration in the excretion. The ideal dye for such use must be non-toxic, a crystalloid, removed in the first instance from the blood-stream by the liver, and must remain in the blood-stream long enough for a determination to be made.¹⁴ Many dyes have been used, and their excretion studied in urine, fæces, or bile, together with abnormal retention in the blood.

1. *The Phenoltetrachlorphthalein Test.*—This dye is eliminated entirely by the liver (Rosenthal), and the liver's power of dealing with it after intravenous injection suggested its use as a test of hepatic function.¹⁵ At first efforts were made to estimate quantitatively the amount recoverable in urine and fæces,¹⁵ duodenal contents,¹⁶ and later to note the time of appearance in the duodenum.¹⁷ All these methods have obvious disadvantages, which were partially overcome when Rosenthal¹⁸ suggested gauging liver function by the amount and time of retention of the dye in the blood. In dogs with a damaged liver he found a greater concentration and longer retention than in normal ones. In these animals he also found that 12 per cent of liver substance must be removed to give a positive result.²⁰

Clinically, a solution containing 5 mgrm. of the sterile dye per kilo. of body weight is injected into a vein after withdrawing 10 c.c. of blood. At varying intervals, generally one and three hours after injection, 5 c.c. samples of blood are withdrawn, and the concentration of dye present compared with known standards, and curves plotted.¹ There is evidence that the curves are parallel with the degree of liver impairment. Full details are given in Rosenthal's papers.¹⁸ He thinks that part of the dye is at once removed by the liver, while a part diffuses into the body tissues, which yield up their supply as the concentration in the blood falls. Dangers are local induration at site of injection, venous thrombosis, rigors, and chills. Deaths have been reported a few days after injection.^{14, 19} The test seems of no value in certain cases of jaundice (particularly obstructive, possibly owing to mechanical interference with the excretion of the dye,^{19, 20}), syphilitic metastases, and cirrhosis of the liver. R. Ottenberg, S. Rosenfeld and L. Goldsmith²⁰ consider a positive test of value, but are dubious as to negative results. After examining 103 cases, of which they give full clinical details, they consider 5 per cent at one hour suspicious, and 8 per cent conclusive, of impaired liver function. The test has supporters.^{19, 21, 22, 23} S. Maurer and L. C. Gatewood¹⁴ prefer the duodenal tube method, as do W. W. Boardman and G. D. Schoonmaker,²³ but hold the results are practically the same as with the blood method. The last-named state that with the tube an initial appearance of the dye at eleven minutes or over, with a maximum at fourteen minutes or over, indicates liver disturbance. The test was found useless by V. R. Deakin and E. G. Graham,²⁴ and P. F. Williams.²⁵ Lamson and his co-workers²⁶ consider the bilirubin content of the blood more valuable (W. Bloom and W. H. Rosenau²⁷ deny this), and A. Gonzalez and W. G. Karr²⁸ prefer the hæmoclastic reaction, as it is not dependent "on the patency of the biliary passages".

2. *Bromsulphalein Test.*—S. M. Rosenthal and E. C. White² have recently brought out a new dye, bromsulphalein, which they consider "to be ideal for the purpose of testing liver function" and superior to phenoltetrachlorphthalein. "Normally it is rapidly removed by the liver-cells, since, when the liver is extirpated, it is retained in the blood serum almost *in toto* during the early

period following its injection". Two milligrammes of dye per kilo. of body weight are injected intravenously, samples of blood withdrawn in 5 and 30 minutes, and the percentage of the dye present estimated by colorimetry. Normal curves have been prepared, and it is claimed that the percentage of dye present 30 minutes after injection expresses directly the degree of impaired function. In 20 cases it gave results corresponding to clinical indications. It is too early to pass judgement, but bromsulphalein appears to have diagnostic possibilities.

3. *Methylene Blue and Indigo-carmin*.—Bossert and Loers³⁰ observe duodenal contents after subcutaneous injection of methylene blue or indigo-carmin, and note the time of appearance of the dyes in the bile. The test is difficult to interpret, and does not appear reliable. Methylene blue may also be given by the mouth, and its presence in the urine examined.¹

4. *Azorubin S*.—Y. Tada and K. Nakashima³¹ have examined 62 dyes, and select "azorubin S as the best dye for clinical use". It is harmless, stable, easy to determine, and in health mainly excreted in the bile. In normal subjects 5 to 8 per cent is excreted in the urine, which is clear again in six to ten hours; duodenal contents are stained in seventeen minutes after injection. Four c.c. of a 1 per cent solution are injected into a vein, and in liver impairment or biliary tract obstruction a large proportion is excreted in the urine and over a longer time. Reports of cases are to be published shortly. The last two tests may be interfered with by kidney disease.

5. *Rose Bengal*.—G. D. Delprat, N. N. Epstein and W. J. Kerr³² advocate the use of rose Bengal: 100 to 150 mgrm. of the dye are injected into a vein, and samples of blood collected 2, 4, and 8 minutes later. The percentage of dye present is obtained by colorimetry, represented graphically, and compared with normal curves. The technique is not easy, and the calculations are involved. "A rough estimate can be formed of the extent of liver disease"³².

Hæmoclastic Crises.—This test is described and discussed by Gruner.¹ It is founded on the theory that proteose substances in the systemic circulation disturb the colloidal balance of the blood, and produce a complex known as the 'hæmoclastic reaction', manifested by lowering of the blood-pressure, hypercoagulability, leucopenia, decreased refractive index of the blood, and fewer blood-platelets. Widal thought that proteoses reach the systemic circulation, should the liver fail in its function, after the ingestion of protein. The protein generally employed is milk (200 c.c. approximately), given after a five-hours' fast. As a rule change in the number of white cells is alone considered. One count is taken before drinking the milk, and then four consecutive counts are made at half-hour intervals. Feinblatt has constructed a chart showing normality.¹ Gonzalez and Karr²⁵ consider it more accurate than the phenoltetrachlorophthalein test, but suggest combining the two. Andreen-Svedberg³³ found it correct in 16 cases of hepatic disease. Glacer³⁶ considers the test a sign of vagotonia. Piersol and Bockus³⁵ found the method 'unreliable', and consider the liver only plays a part in a very complicated mechanism. Shaw³⁴ has made an exhaustive study of the test, both by blood-count and estimation of blood-pressure. He thinks the test theoretically unsound, as normally the leucocytic count is in a state of flux, "and the single count made before the test does not represent a state of equilibrium". He quotes figures in support of this point, and suggests this as the reason for conflicting results by different observers. He regards the blood variations as being physiological, and not the result of food ingestion. In Shaw's opinion the test is of "no value in the diagnosis of hepatic efficiency"; with which statement most observers agree.

Conclusions.—(1) The liver has great reserve capacity, and in pathological states there is usually enough normal tissue to carry on function. Hence hepatic efficiency tests may be negative even though there is much liver damage. The tests fail, therefore, in those cases in which they would be of most use. (2) The liver has great powers of compensatory hyperplasia. In chronic liver disease impairment of function is in direct proportion to the distribution and rate of development of the fibrotic tissue. (3) The kavulose tolerance test is probably the most useful; the phenoltetrachlorophthalein test is largely used in America. (4) A common objection to the use of dye excreted in the bile as a liver function test is the difficulty of separating the effects of impaired hepatic function from those of biliary obstruction. If the dye is excreted in the urine, kidney disease also may falsify results.

REFERENCES.—¹*Med. Annual*, 1924, 262; ²*Jour. Amer. Med. Assoc.* 1925, April 11, 1112; ³*Ann. of Surg.* 1924, lxxx, 419; ⁴*Arch. of Internal Med.* 1925, June, 698; ⁵Beaumont and Dadds, *Recent Advances in Medicine*, 1925; ⁶*Arch. of Internal Med.* 1922, June; ⁷*System of Medicine*, Tice, 1st Edit.; ⁸M. Brûlé, *Recherches sur les Ictères*, 1922; ⁹*Arch. of Internal Med.* 1923; ¹⁰*Amer. Jour. Physiol.* 1924, lxxix, 393; ¹¹*Ibid.* 1922, Jan.; ¹²*Arch. of Internal Med.* 1925, Feb., 177; ¹³*Jour. Amer. Med. Assoc.* 1924, Oct. 4, 1110; ¹⁴*Ibid.* 1925, March 28, 935; ¹⁵*Johns Hop. Hosp. Bull.* 1913, No. 24, 327; ¹⁶*Jour. Lab. and Clin. Med.* 1915, No. 1, 822; ¹⁷*Jour. Amer. Med. Assoc.* 1921, Nov. 19, 1631; ¹⁸*Ibid.* 1923, Dec. 23, 2151; *Johns Hop. Hosp. Bull.* 1922, Dec. 432; *Jour. Pharmacol. and Exper. Therap.* 1922, June, 385; *Jour. Amer. Med. Assoc.* 1924, Oct. 4, 1049; ¹⁹*Surg. Gynecol. and Obst.* 1925, March, 411; ²⁰*Arch. of Internal Med.* 1924, Aug., 206; ²¹*Amer. Clin. Med.* 1923, No. 11; ²²*Amer. Jour. Med. Sci.* 1923, Nov., 166; ²³*Ibid.* 1924, Nov., 688; ²⁴*Surg. Gynecol. and Obst.* 1923, March, 348; ²⁵*Amer. Jour. Obst. and Gyn.* 1922, No. 4, July, 26; ²⁶*Jour. Pharmacol. and Exper. Therap.* 1924, Nov., 215; ²⁷*Arch. of Internal Med.* 1924, Oct., 446; ²⁸*Ibid.* Sept., 282; ²⁹*Jour. Pharmacol. and Exper. Therap.* 1924, June; ³⁰*Jour. Amer. Med. Assoc.* 1925, Jan. 24, 323; ³¹*Ibid.* 1924, Oct. 25, 1292; ³²*Arch. of Internal Med.* 1924, Oct., 533; ³³*Hygiea*, Stockholm, 1923, Feb. 28, 115; ³⁴*Brit. Med. Jour.* 1925, ii, 914; ³⁵*Jour. Amer. Med. Assoc.* 1924, Oct. 4, 1043; ³⁶*Med. Klinik*, 1922, No. 18, March 1, 331; ³⁷H. L. Tidy, *A Synopsis of Medicine*, 1925.

LUNG, ABSCESS OF.

W. H. Wynn, M.D., F.R.C.P.

Abscess of the lung appears to be much more common in America than in this country, and it is not unusual to read articles containing analyses of cases running into the hundreds and seen by one observer. The increased incidence of the disease is attributed to the greater number of nose and throat operations under general anæsthesia. F. T. Lord¹ records a series of 227 cases. The importance of operations about the upper respiratory tract is shown by the fact that one in every three cases followed such a procedure. Tonsillectomy was responsible for the largest single group, 49 cases. Extraction of teeth was responsible for 21; 8 cases were due to operations for cancer of the jaw, tongue, or lip (1 each), drainage of peritonsillar abscess (2), removal of adenoids alone (1), and nasal operations (2); 18 further cases were ascribed to operations under general anæsthesia, making a total of 96 (42 per cent). Inhalation of a foreign body accounted for 8. Altogether half the cases were traceable to aspiration of infected material. In about a third the onset was insidious and the cause uncertain. In 10 metastatic infection seemed to be responsible. Lobar pneumonia was of little importance as a cause, and an origin in bronchopneumonia was uncertain. Lord gives five cardinal indications for diagnosis: (1) Cough and explosive expectoration. The sudden expectoration of a large amount of pus is almost without exception due to one of three causes: the rupture of a pulmonary abscess, empyema, or subdiaphragmatic abscess. Explosive expectoration occurs in only 10 per cent of cases. Cough is ordinarily productive, and the sputum raised in small or large amounts at frequent intervals. At times there is periodical evacuation of considerable pus once or twice in the day, with comparative freedom between. (2) Foul breath and sputum. Both may be present, but foul breath is the commoner.

It may be noted only at the end of a paroxysm of coughing. Foul breath and sputum seldom occur apart from abscess (the author does not distinguish abscess from gangrene); but occasionally abscess occurs without this symptom. (3) Elastic tissue in the sputum. When unaccompanied by tubercle bacilli, elastic tissue is certain evidence of a destructive lesion. (4) Dullness on percussion over a circumscribed area. The most common single physical sign is dullness; other signs are variable, and depend upon the site, whether the abscess is open or closed, and the condition of the surrounding tissues. (5) X-ray examination. This is indispensable. The most characteristic appearance is a roughly circular area of increased density, with moderately defined margins surrounding a central rarefied area. A fluid level may be detected. The estimated mortality of abscess treated by medical means is given as 75 per cent. Of the remaining 25 per cent, 15 continue to cough and expectorate, and are in danger of recurrent febrile attacks and extension of inflammation into the neighbouring lung. Complete recovery without operation may be expected in about 10 per cent. The cause of the abscess did not seem to influence the outlook, but early diagnosis and prompt postural drainage were important. An abscess at or above the level of the lung root was more favourable than one in the lower lobes.

A preliminary trial of **Postural Treatment** is advised. How long this treatment should be continued depends upon the seriousness of the case. An estimate should be made of progress by the symptoms, leucocyte count, and X-ray examinations. Persistence of fever, unabated septic symptoms, and increase in the local signs should indicate **Operative Treatment**. Improvement in local drainage by **Bronchoscopic Aspiration and Lavage** may be considered, especially in deep abscesses near the root. In Lord's series, 117 were operated upon and 47.8 per cent died, 15.3 per cent completely recovered, 18.8 per cent still cough, and 18 per cent cannot be traced. **Artificial Pneumothorax** involves the risk of inducing an empyema and makes later operation more difficult. Recent centrally placed abscesses without pleural involvement are the most favourable for this method.

A. E. Greer² records 33 cases, 12 of which followed operations under general anesthesia, and three-quarters of these were operations on the nose or throat. In 33 per cent influenza was responsible, and in 15 per cent pneumonia. There was a predilection for the lower lobes, especially on the right side. In his series **Incision and Drainage** gave the best results—37.5 per cent recoveries. Of 8 cases treated by incision and drainage, 3 recovered, 3 improved, and 2 died. Of 12 treated by artificial pneumothorax, 4 recovered, 2 improved, and 6 died. Of 13 cases with postural drainage, 3 recovered, 4 improved, 2 were unimproved, and 4 died. The recoveries were thus 37.5 per cent after operation, 33.3 per cent after pneumothorax, and 23 per cent with postural drainage. He advises that artificial pneumothorax should never be performed during the acute stage, but it may be tried in chronic localized cases without pleural adhesions.

W. F. Moore and R. M. Lukens³ agree that aspiration is the commonest cause of pulmonary abscess. They consider the use of one method of treatment to the exclusion of others a mistake, and advise bronchoscopic treatment in suitable cases. This consists in draining the affected area after thorough aspiration. The cleansing is done with a special solution containing **Trinitrophenol** 2 gr., **Lugol's Solution** 1 drachm, normal saline 1 pint. An analysis of their cases treated at the Bronchoscopic Clinic showed: cured 21.4 per cent; improved 57.2 per cent; unimproved 21.4 per cent.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1925, April 23, 785; ²*Amer. Jour. Med. Sci.* 1925, March, 345; ³*Jour. Amer. Med. Assoc.* 1924, Oct. 25, 1369.

LUNG, FUSOSPIROCHÆTOSIS OF.*W. H. Wynn, M.D., F.R.C.P.*

The important part played by the fusiform bacilli and spirochaetes in certain lesions of the lungs, especially those associated with abscess formation and gangrene, is becoming more clearly defined. I. Pilot and D. J. Davis,¹ who have made an elaborate study of these organisms, consider that they produce a type of infection which may be regarded as a clinical entity. The lesions in the lungs are characterized by a tendency to necrosis and a foul smell. The simplest lesion is a putrid bronchitis, but more common is a bronchopneumonic consolidation with formation of a single abscess. In more extensive lesions the bronchopneumonic areas become confluent and the areas of necrosis multiple. The most severe form is a diffuse gangrene. A whole lobe or the entire lung may be involved, with multiple cavitations, and it becomes green and putrid.

The infections appear to arise from organisms normally resident in the mouth and upper respiratory tract. The organisms are especially numerous in tartar deposits, about carious teeth and pyorrhœic gums. They are also found in the foul granular masses lying in tonsillar crypts and in the nasopharynx. In the extensive literature on pulmonary abscess and gangrene it has usually been assumed that the ordinary pyogenic organisms were responsible for the lesions, and little attention was paid to the existence of anaerobes. Pilot and Davis consider that the most important cause to-day of abscess and gangrene is general anaesthesia, especially in connection with tonsillectomy. In a few instances they are superimposed on such pathological states as pneumonia, bronchitis, bronchiectasis, tuberculosis, and carcinoma. Foreign bodies, and perforating lesions of the bronchi, may also carry infection into the lungs. The organisms appear to be saprophytic under normal conditions. Their pathogenicity is low, and experimentally in animals large doses are required to produce a lesion; but when mixed with a pyogenic organism, particularly the streptococcus, putrid lesions result. There appears to be a true symbiosis. The normal lung does not harbour these organisms, but they may establish a habitat in the bronchi and lead a saprophytic existence in bronchiectasis, chronic bronchitis, and bronchial asthma. If patients with these bronchial conditions develop an acute infection, or if the general resistance be greatly lowered, for instance by diabetes or malnutrition, a putrid bronchitis may be set up, finally ending in abscess or gangrene. Tuberculosis and lobar pneumonia are rarely complicated by fusospirochaete infection, but carcinoma is often terminated by it. Of 37 cases observed by the authors, 7 followed tonsillectomy, 4 abdominal operations, 6 bronchiectasis, 4 tuberculosis, 3 carcinoma, and 3 trauma. Other causes were a foreign body, pneumonia, diabetes, infarct, and pyelonephritis. Both abscess and gangrene may develop rapidly, especially after anaesthesia. In the simple abscess, cough sets in, together with rise of temperature, and usually leukocytosis. The lesion softens in twelve to fourteen days, and may drain gradually or rupture into a bronchus, with the expectoration of foul-smelling pus. Physical signs are variable, and may be masked by an effusion. Most of the single abscesses end favourably, with a fall of temperature to normal in a few days or weeks, and disappearance of sputum. In a few, progressive involvement of new areas leads to the formation of multiple cavities, with more severe symptoms and prolonged course. Acute gangrene appears with pain in the chest and cough accompanied by very foul breath and putrid green sputum. The physical signs may show involvement of a whole lobe or lung, with signs of large cavitation. The course is generally over a period of two or more weeks, with death from toxæmia. Extension of infection to the pleura, with formation of an odourless effusion containing streptococci, is not uncommon. A more serious complication

is the development of a putrid empyema or pyopneumothorax. A striking result, peculiar to the fusospirochæte infection, is the development of a single or multiple metastatic putrid abscess in the brain.

The diagnosis depends upon the examination of the sputum (*Plate XXXVI*). When specimens are taken, the patient should be instructed to clean the teeth thoroughly and to use a mouth-wash to reduce the number of anaerobes normally in the mouth. Examination of a fresh specimen may show fatty-acid crystals, tissue debris, pus, elastic tissue, and masses of bacteria. Five to ten per cent carbol fuchsin, or the Fontana method for spirochætes, may be used. Pleomorphic forms of fusiform bacilli, together with spirochætes and streptococci, are the commonest combination of organisms found. Not all pulmonary conditions with foul sputum are due to fusospirochætes; intensely foul sputum may be found with *B. pyocyaneus* infection.

For treatment, Arsenic, especially Neo-arsphenamin, is advised; 0.3 to 0.9 gm. administered once a week gives favourable results with abscesses (*Plates XXXVII, XXXVIII*). In bronchiectasis, treatment may benefit the complicating infection and possibly prevent the formation of new cavities. In gangrene, it is evident that treatment must be begun very early to cause any improvement. When surgery is necessary, neo-arsphenamin should also be used.

The *bronchial spirochætosis* described by Castellani² as a cause of hæmoptysis, especially in the tropics, appears to be due to a different organism. The sputum is thin, odourless, watery, and often vivid pink in colour. The condition responds well to Sodium Cacodylate and Neo-arsphenamin, and leads to rapid recovery. Confusion may arise if only spirochætes are sought for. It is the association with fusiform bacilli which causes the characteristic lesions of abscess and gangrene.

REFERENCES.—¹*Arch. of Internal Med.* 1924, Sept., 313; ²*Jour. Trop. Med. and Hygiene*, 1919, 1882.

LUNG, SURGERY OF. (See CHEST.)

LUPUS ERYTHEMATOSUS.

E. Graham Little, M.P., M.D., F.R.C.P.

Acute Disseminated Lupus Erythematosus.—C. S. Keefer and A. R. Felty¹ report in very full detail three cases, in adult females, of this disease, observed in Johns Hopkins Hospital. All died, and, in two, post-mortems were obtained. In one case inoculation of material from an enlarged gland into a rabbit produced caseous tubercles showing an acid-fast bacillus, and material from a gland removed at the autopsy and injected into guinea-pigs produced generalized tuberculosis. An enlarged gland examined during life in the woman in whom a post-mortem was not obtained showed no evidence of tubercle upon histological examination, but animal experiments do not seem to have been made. In the third case caseating areas were found post mortem in the liver and in most of the enlarged glands. It is notable that there was no clinical evidence of tuberculosis in any of the cases. Arthritis, fever, profound prostration, and general glandular and splenic enlargement were present in all cases, as well as the characteristic diffuse eruption, which occupied the face, extremities, chest, and trunk.

REFERENCE.—¹*Johns Hop. Hosp. Bull.* 1924, Sept., 294.

LUPUS VULGARIS.

E. Graham Little, M.P., M.D., F.R.C.P.

W. Sampson Handley¹ contributes a very important paper on the treatment of lupus vulgaris, which he states bluntly is not a disease of the skin, but of the lymphatic system not restricted to the skin. The study of the distribution of pigment along the lymphatic vessels in melanotic sarcoma, as well as

PLATE XXXVI.

FUSOSPIROCHÆTOSIS OF THE LUNG

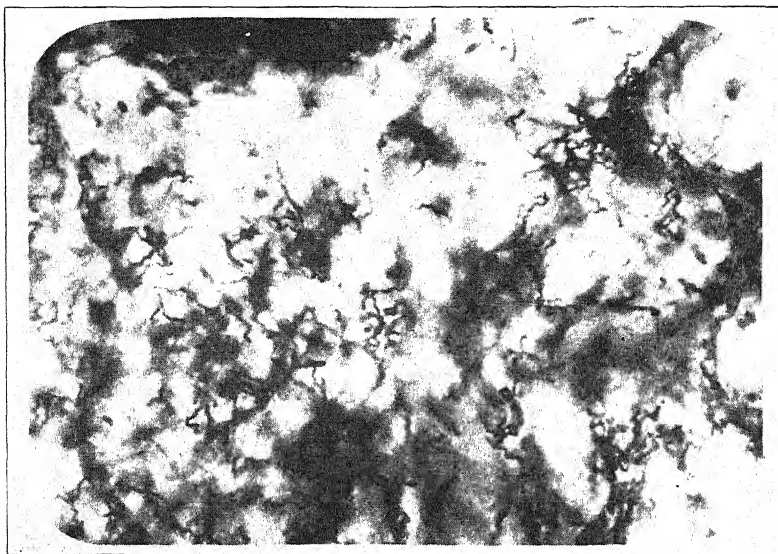


Fig. A.—Large masses of spirochaetes observed in pulmonary gangrene.



Fig. B.—Spirochaetes in tuberculous lung (Levaditi stain).

Plates XXXVI—XXXVIII by kind permission of the 'Archives of Internal Medicine'

PLATE XXXVII.

FUSOSPIROCHÆTOSIS OF THE LUNG—*continued*

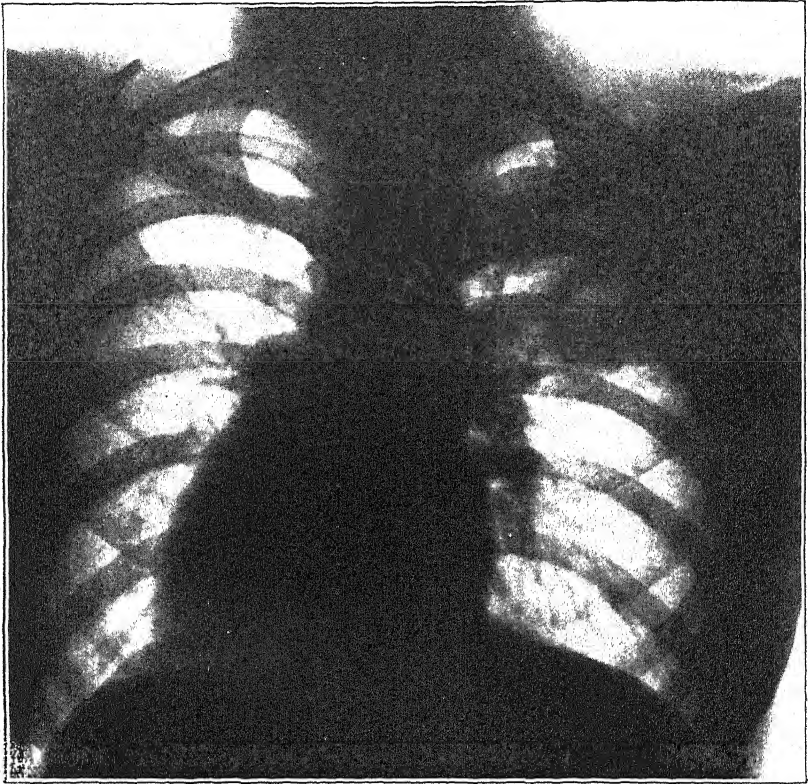


Fig. C.—Post-tonsillectomy pulmonary abscess in right upper lobe before neo-arsphenamin therapy.

PLATE XXXVIII.

FUSOSPIROCHÆTOSIS OF THE LUNG—*continued*



Fig. D.—Post-tonsillectomy abscess after neo-arsphenamin therapy.

of injection of specimens, lead him to describe the vascular supply of the skin in a very novel way, a diagrammatic representation of which is reproduced (*Fig. 36*). Upon this observation he believes that "for purposes of lymphatic circulation the skin is divided into small independent areas, $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter, between which little or no lateral lymphatic communication exists." This explains why infections, which spread along lymphatic vessels, do not extend in the plane of the skin.

The marks of lymphatic involvement, as affecting the skin, are: (1) The lesions are nodular. (2) They are at first discrete and separate, and only later fuse into one with the original lesion. (3) The layer primarily affected is the superficial third of the corium, the layer which is richest in lymphatic vessels. Further characteristics of lymphatic invasion are: (4) Nodular deposits may appear along the course of the trunk lymphatic vessels. (5) The glands to which they run become enlarged. (6) The disease may then further disseminate to the internal organs.

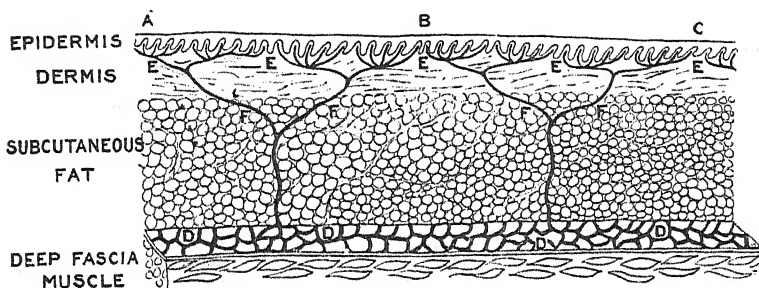


Fig. 36.—To show the lymphatic arrangements of the skin. A schematic vertical section of the skin and subcutaneous fat, with a small horizontal shelf of deep fascia projecting forward from it. Below this is muscle in vertical section. A B and C are two of the primary lymphatic areas of the skin. These areas measure one-third to half an inch in diameter, and the only lympho-vascular communication between them appears to be by way of the subcutaneous lymphatic plexus D D D D which is seen on the fat. The lymphatic end-sacs of the skin-papillae unite by groups of five or six to form small lymphatic vessels, which again unite in the superficial third of the dermis (plane of primary confluence E E E) to form other lymphatic vessels which pierce the dermis vertically and unite just beneath it (plane of secondary confluence F F F) into a smaller number of vessels which run down through the subcutaneous fat to discharge into the fascial lymphatic plexus D D D. (*Kindly lent by the 'Lancet'.*)

Examination of the skin in the neighbourhood of lupus patches has convinced the author that quite early changes take place in the lymphatics. As a corollary of his views, the author recommends that, in excising patches of lupus, it is useless merely to excise the skin. An area of deep fascia, at least as large as the area of skin excised, should be taken away in one piece with it. Excision should, in fact, go down to the muscular tissue. The method is obviously limited to parts of the body where mutilation is not contra-indicated; it is usually impossible on the face. The author asserts, in explanation of the comparative non-malignancy of carcinoma developing upon lupus, his belief that the lymphatic channels become blocked by the tuberculosis processes and consequently are not available for the dissemination of carcinoma. Where operation is impossible, for any reason, the author considers Radium is the best means of treatment. This paper is well worth detailed study.

Whitfield² has had some remarkable results with Ionization, the technique of which is thus described: The affected area was thoroughly cleansed with warm water and soap, dried, and sponged over with a 5 per cent solution of potassium hydrate, which was left on for three minutes and then washed

off with warm water, the object being to remove the resistant layer of skin which covers the tubercles. The patient then sat in a papier-mâché bowl on eight thicknesses of 'Turkish towel', under which was an electrode eight inches square. A 2 per cent solution of zinc sulphate was put into the bowl in such quantity that the affected area was covered. The scrotum, which was not affected, was protected by being anointed with soft paraffin. The positive terminal was connected to the electrode in this bowl. The negative pole was in a similar bowl containing a 1 per cent solution of common salt, into which the patient put his feet. A current of electricity was then turned on, beginning at zero, and slowly increased until it reached 40 to 50 ma., and was continued for about ninety minutes. No dressings were used other than clean under-garments. In a case described, and illustrated here (*Plate XXXIX*), during the three years' treatment 54 applications were made, as follows: first year 21, averaging 44 ma. for 84 min.; second year 18, averaging 32 ma. for 77 min.; third year 15, averaging 27 ma. for 61 min.

Milner³ has used Diathermy with success in the treatment of resistant lupus vulgaris, and describes the method used. The apparatus required is a diathermy machine and a condenser couch. One terminal is connected to the couch; the other is connected to the patient's body by means of a large electrode wrapped in a thick pad which has been soaked in a strong hot salt solution. If an electrode about the size of a darning needle, well earthed to a water pipe, be now brought to about $\frac{1}{16}$ in. from the patient's body, a succession of sparks will pass with great rapidity to earth. Ether should not be used for the anæsthetic on account of its inflammability. When the patient is unconscious the patch of lupus to be treated should be mapped out by a line of sparks, leaving about $\frac{1}{2}$ in. of healthy tissue inside the circumscribed area. The patch is then completely sparked over. The result should be a charred dry surface, which may be dressed with this cream: bism. subnit. 2 drachm, dicalamine 2 drachm, paraffin liq. $\frac{1}{2}$ oz. Crusts form, and separate in from 14 to 21 days, and healing is generally complete in 5 to 6 weeks. The operation may have to be repeated once or twice. The abstract of cases cited by the author is the best commentary on the success of the method. He says: "The following analysis of cases treated excludes all cases in which nasal or other mucous membranes are affected by lupus: total number of lupus vulgaris treated, 60; cases cured, 42; cured by one operation, 5; cured by two operations, 5; total number of operations performed on cases cured, 145; average number of operations for each case cured, 3.5; average time occupied in treatment of each case, 3.4 months. Time elapsed since cure was effected: over four years, 1 case; over three years, 13 cases; over two years, 6 cases; under two years, 22 cases."

REFERENCES.—¹*Ann. of Surg.* 1925, Jan., 9; ²*Lancet*, 1925, i, 1026; ³*Glasgow Med. Jour.* 1924, Aug., 110.

MALARIA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—S. R. Christophers¹ has made an important contribution to the subject of the development of immunity to malaria in a hyperendemic area in the Chota Nagpur area of India, which confirms and amplifies the work of Schuffner in Sumatra. The labour force of an iron mine was investigated, and the number of parasites estimated in the blood of 210 children and 159 adults, with a spleen-rate of 70 per cent in children and 10 per cent in adults; he came to the conclusion that probably all the community are continuously infected, beginning with 'acute infestation' with continuous malarial attacks during the first two years of life with about 10,000 parasites per c.mm., followed by a period of 'immune infestation' with greatly reduced parasite rate lasting

PLATE XXXIX.

LUPUS VULGARIS



Fig. A.—Before treatment by ionization.

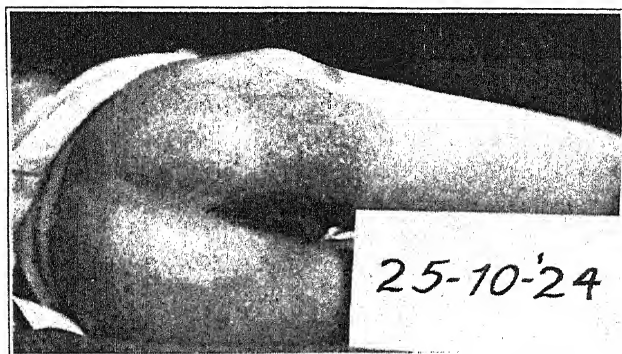


Fig. B.—After treatment, three years later.

By kind permission of 'The Lancet'



into adult life, with attacks every two to four weeks during childhood and every six months in later life. When adult life is reached, only about 50 per cent show small numbers of parasites in their blood, with only about 100 parasites per c.mm., while the remaining half have by this time developed immunity. Children entering the area at a later age went through a milder period of 'acute infestation' if over five years of age. The larger-sized spleens were met with in the period of 'immune infestation'; crescents were most numerous during 'acute infestation' in proportion to the asexual proliferation of the parasites, carriers with 10 or more per c.mm. forming 18 per cent in children and 5 per cent among adults, the total number of crescents being far greater in young children. There was no evidence that the true aboriginal races had more immunity than recently immigrant ones. Definite acquired immunity is shown by the ability of individuals to live infected, but free from sickness, where new-comers, including the newly-born, suffer from almost continuous heavy infection.

C. Strickland² notes that in the Eastern Himalayas the malarial season in Kurseong at 3500 feet is from April to July, and ceases with the heavy monsoon rains washing away the stream-breeding *A. maculatus*, while in Shillong at 6000 feet the maximum season is from May to October owing to the same mosquito breeding in rice swamps at the foot of the hills, which he suggests could be dealt with by a system of hill-foot contour drains as used in Malaya. He also found in Shillong an inverse ratio between the rainfall of the previous year and the malaria.

MALARIA CONTROL.—Malcolm Watson³ reports on a visit to Assam and Mian Mir during the non-malarial cold season, and suggests that the dangerous *A. maculatus* and *A. minimus* can only be dealt with by the system of deep drains used by him with success in Malaya, together with the administration of cinchona to children and all fever cases. B. S. Chalam⁴ reports on a six-months' campaign against mosquito breeding-grounds formed by the Bombay Black Bay reclamation scheme, in which the usual oiling and other measures were carried out, but it is too early to estimate the results. R. Senior-White⁵ reports a saving of three-fourths of the estimated loss due to malaria on a rubber estate by oiling the *A. maculatus* breeding-grounds; two springs and a swamp were economically dealt with by placing in them pieces of sacking soaked in the semi-solid residue from the bottom of tanks for storing crude engine oil, which gives an effective slowly-moving film on the streamlet lasting for about two days and requiring repetition once a week. H. A. Spencer⁶ in South Africa has found mosquito-gauzed houses and nets, not less than 3 feet wide, including small conical nets to cover the face when sleeping in camp, the best prophylactic measure, while 5-to 10-gr. doses of quinine, in the absence of net protection, are also of value.

CLINICAL.—A. Pagnier and P. Schrumpf-Pierron⁷ record an interesting clinical study of malaria in the Near East and Europe on ten years' work during the war and after, in which many cases were kept under observation for long periods. The paper includes an elaborate daily chart of the prevalence of benign and malignant tertian cases during twenty-six months, and of the maximum and minimum temperatures and rainfall, which shows a winter rise of benign tertians from February to April, and of malignant tertians from September to November, when benign tertians are very few. [A very similar incidence was shown by me in Calcutta in 1906 (*Ind. Med. Gaz.*, March).—L. R.] They consider their curves to depend on the air temperature, for the benign tertians increased when the temperature reached zero, and continued as long as it did not go over 5° to 10° C., while malignant tertian malaria only began with a temperature of 25° to 30° C., and lasted until it fell to about

5° C. again. They found that **Quinine**, while not warding off attacks of fever, lessened the severity of the attacks and the chance of mosquito infection. Benign tertian cases had sharp short attacks, with steady low temperature between, but malignant tertian attacks are preceded and followed by thermal oscillations up to 2° C. Prophylactic quinine did not prevent the disease, but greatly lessened the severity of the attacks, so it is logical to continue to advocate preventive treatment with quinine. Patients with benign tertian infection should avoid temperatures below 5° C., and malignant tertian ones those over 25° C., so the former should be sent to warm, and the latter to cold countries. They only advise giving quinine to infected patients at the time of malarial attacks.

G. de M. Rudolf⁸ reports on inoculated benign tertian malaria in general paralysis cases, in which the temperature curve was studied, and found completely tertian types to be rather more frequent than completely quotidian, while sometimes the types changed from one to the other. J. L. Jones and H. C. Brown⁹ report a case of congenital benign tertian malaria beginning on the sixteenth day after birth, the mother suffering from the same disease. V. C. W. Vickers¹⁰ finds suppressed malaria to be common in S. Rhodesia, and to produce anæmia and debility, mild diarrhœa, or miscarriages, without actual malarial attacks, which are both curable and preventable by antimalarial measures. C. B. Masson¹¹ deals with malarial psychoses, which are predisposed to by alcoholism and hereditary taint, the former especially leading to delirium; depression is most frequent in children and in chronic infections, neuralgias and headaches in acute cases; many of them clear up if the malarial element is recognized and treated. A. Pijper and B. D. Russell¹² have studied the red-cell count during the incubation period of inoculated malaria, and found a primary rise of 10 to 30 per cent, followed by a fall when the fever develops; they consider the rise to be due to a direct stimulus to the red bone-marrow. R. M. Gordon¹³ has made a similar inquiry in three malarial cases, and found a diminution of the red corpuscles for several days previous to the appearance of the parasites in the blood, while the colour index showed a simple type of anæmia. Gordon¹⁴ has also investigated the diagnostic value of urinary changes in malaria, and found no individual test to have any real value, but a combination of urobilin and albumin in the urine was at least strong evidence, although not certain proof, of malarial infection. J. A. Sinton and T. A. Hughes¹⁵ have investigated the functional capacity of the liver in malaria by means of the levulose tolerance test, and found some disturbance, but not marked inefficiency, of the glycogenic function of the liver in a certain number of ordinary acute cases of malaria; they think it may be greater in pernicious cases, indicating the ingestion of glucose or levulose to protect the liver.

TREATMENT.—A. T. Gage¹⁶ discusses the cultural point of view of cinchona alkaloids, and gives analyses of the different cinchona barks; he points out that 90 per cent of the world's bark consists of *C. Ledgeriana* and its hybrid with *C. succirubra*, which have a very high quinine content, so that any proposal to replace quinine largely with other alkaloids would not be practicable. C. Lane¹⁷ deals with the theoretical aspects of the action of **Quinine** in malaria, and points out that we are still ignorant of the precise manner in which the drug acts, whether directly on the parasites in the blood, or after the large amount not excreted has been converted into some other form in the tissues; and he throws doubt on Acton's contention that quinidine sulphate is especially efficacious in benign tertian malaria. G. Causade and A. Tardieu¹⁸ advocate the Bretonneau-Trousseau method of giving 8-grm. doses of *Cinchona calisaya* powder in one or two doses immediately a febrile access has passed, repeating on the fifth day, and then every eighth day for a month. W. E.

Deeks¹⁹ discusses the results of treatment in inoculated malaria in general paralysis indicating that prophylactic quinine does not prevent infection. He states that extensive experience on the United Fruit Company's estates proves that 15 to 20 gr. twice a week greatly reduces the hospital admissions and serious morbidity, so is apparently enough to limit the parasitic development sufficiently to prevent symptoms and establish tolerance. In treatment he advises in primary infections 30 to 60 gr. daily for two or three days, and reduced doses one to two weeks longer, which will cure the vast majority of cases; in relapsing cases arsenic and tonics are required in addition to quinine. H. W. Acton and R. N. Chopra²⁰ record analyses of the amount of quinine in the mesenteric and general-circulation blood in animals experimentally treated, which show greater concentrations in the former, thus supporting the theory that malignant tertians are more easily cured than benign ones, on account of the former sporulating in the mesenteric vessels. J. A. Sinton²¹ quotes recorded examples of the apparent failure of quinine in malaria in India due to dishonest dispensers making up weaker solutions than those ordered, and describes a simple method of estimating approximately the strength of quinine solutions by comparing the opacity resulting from the addition of Tanret's modification of Mayer's reagent with the barium sulphate opacity tubes devised by Brown for standardizing vaccines, or by comparison with quinine solutions of known strengths treated with the same reagent.

F. Valenti and A. Tomaselli²² report two cases, one of quartan and one of benign tertian malaria, treated with one to two lozenges of Stovarsol for ten days, with disappearance of the parasites in a few days and rapid reduction in the size of the spleen.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1924, Oct., 273; ²*Ind. Med. Gaz.*, 1924, Nov., 549; ³*Lancet*, 1925, ii, 962; ⁴*Ind. Med. Gaz.*, 1924, Oct., 481; ⁵*Ind. Jour. Med. Research*, 1925, Jan., 545; ⁶*Jour. Trop. Med. and Hyg.*, 1925, June 1, 207; ⁷*Ibid.* March 16, 117; ⁸*Ibid.*, 1924, Oct. 1, 259; ⁹*Lancet*, 1924, ii, 1058; ¹⁰*S. Afric. Med. Record*, 1924, Sept. 13, 404; ¹¹*Amer. Jour. Med. Sci.*, 1924, Sept., 334; ¹²*Brit. Med. Jour.*, 1924, ii, 620; ¹³*Ann. of Trop. Med. and Parasitol.*, 1924, Dec. 30, 594; ¹⁴*Ibid.*, Oct. 31, 351; ¹⁵*Ind. Jour. Med. Research*, 1924, Oct., 409; ¹⁶*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1925, Jan. 15, 347; ¹⁷*Ibid.*, 352; ¹⁸*Presse méd.*, 1924, Dec. 13, 989; ¹⁹*Jour. Trop. Med. and Hyg.*, 1925, Jan. 15, 21; ²⁰*Ind. Jour. Med. Research*, 1925, July, 197; ²¹*Ibid.*, 25; ²²*Policlinico*, 1924, Sept. 8, 1150.

MALTA FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—J. H. Eyre,¹ in opening a discussion on the relation between infective abortion in cattle and Malta fever, pointed out that in cattle no symptoms occurred until abortion took place, when the organism was found in the discharge from the inflamed vagina, and the disease might be spread by coitus, although usually infection was by the mouth, as with Malta fever in man, but he does not agree with American workers that the two organisms are identical, as under dark-ground illumination the two behaved quite differently. L. E. Bevan¹ had obtained agglutination of *M. melitensis* with the serum of epidemic-abortion animals, and considered that in Rhodesia undulant fever was due to *B. abortus*; but on the whole veterinarians did not regard the two diseases as identical, as milk from animals infected with contagious abortion was extensively used in man without danger. In Southern Rhodesia, however, the two diseases occurred in the same districts, and the serum of Malta fever patients agglutinated the *B. abortus*, and he thought both organisms belonged to the genus *Alkaligines*, and infection was through milk; the human disease there did not differ clinically from that in Europe. Prophylactic measures were now being carried out in South Africa. P. W. Bassett-Smith² referred to the spread of Malta fever from the Mediterranean over the world, and thought the two diseases to be distinct. Salvat y. Navarro²

discusses the epidemiology and close relations between *M. melitensis* and *B. abortus*, and the possible infection of man by the latter, and thinks that only some human subjects are susceptible; he advocates the slaughter of infected animals as a prophylactic measure.

DIAGNOSIS.—L. Nattan-Larrier³ points out the great clinical difficulties in the early diagnosis of Malta fever, for which agglutination in dilutions of 1-50 and over are of value, if the different strains of the micrococcus are used; but he considers that Et. Burnet's intradermic reaction is a more simple and certain test, which is obtainable from the seventh to eleventh days onwards and never fails. A 20-day culture of the *M. melitensis* in broth is passed through a porcelain filter, and the filtrate boiled for one minute, or 0.5 per cent carbolic added; it keeps for five or six weeks in ampoules in a cool place. From 1 $\frac{1}{10}$ to 2 $\frac{1}{10}$ c.c. is given intradermally in the skin of the anterior surface of the arm above the elbow, and in six hours local œdema, with redness and slight pain, forming a prominent, well-defined patch 4 to 6 cm. across, persisting until the fortieth hour, indicates a typical reaction.

REFERENCES.—¹*Lancet*, 1925, March 21, 606; ²*Rev. Españ. de Med. y Cir.* 1924, Nov., 639; ³*Med. Press*, 1924, Oct. 15, 306.

MEASLES.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—F. McCallum and G. A. Blumer¹ report an outbreak of measles on an immigrant ship from London to Australia. Six days after leaving London an infant developed a measles rash, and during the next five weeks fifty more cases were discovered, though probably many others occurred which were not reported. All the cases were mild, and recovery was rapid and uncomplicated. The writers recommend that the following measures should be taken on the discovery of a case of measles on board ship: (1) Compilation of a census of all the children on board, with name, sex, age, cabin number, destination, and previous attacks of measles. (2) Consultation with captain about provision for an outbreak, such as isolation in the ship's hospital, or cabins situated preferably aft away from the ship's general traffic. (3) Daily record of each case, showing exact time of onset and nature of initial symptoms. (4) Daily inspection of all children under 15 years, especially for the initial signs of measles. (5) Isolation of each patient on discovery of the initial symptoms, and provision for dealing with susceptible contacts.

MORBID ANATOMY.—According to J. Denton,² who describes the post-mortem lesions on three subjects, age 12 years, 6 years, and 1 month respectively, in whom death occurred from three to twenty-four hours after appearance of the rash, and was probably due to the virus of measles, the primary lesions are located in the lower trachea, bronchi, and contiguous lung. The mucous membrane of the trachea is œdematous, and groups of superficial cells and solitary deeper cells show degenerative and vacuolar changes. The vessels of the stroma and submucous tissue are dilated and surrounded by large numbers of endothelial leucocytes, plasma cells, lymphocytes, and small numbers of polymorphonuclear leucocytes. The changes in the bronchi are similar, but complicated in places by rather extensive destruction of epithelium. The actual extent of bronchopneumonia is limited, and the primary injury to the lung is apparently not very grave. There are three types of lesion in the buccal mucosa: (1) Focal necroses; (2) Suppurative lesions in and about the submucous glands and their ducts; (3) Inflammatory lesions of submucous lymph follicles. The Koplik spot is an inflammatory lesion of a submucous gland, and the bluish halo about it is due to the collar-like plexus of venules about the duct.

SYMPTOMS AND COMPLICATIONS.—E. W. Goodall³ applies the term *illness*

of infection to a condition, of which he has seen only seven or eight examples in thirty-two years, in which a child exposed to the infection of measles a few hours earlier has developed symptoms strongly suggestive of an attack of the disease, such as slight rise of temperature, sneezing, conjunctival injection, and even a morbilliform rash; but the symptoms disappeared within a day or two. At the end, however, of a period within the limits of the incubation period of measles, the patient developed an undoubted attack of the disease. [Further observations are required to determine whether the so-called 'illness of infection', of which the reviewer has never seen an example, bears a specific relation to measles, or is not merely a coincidence, as its extreme rarity would suggest.—J. D. R.]

J. Mariani⁴ states that *congenital measles* is rare in civilized countries, for the following reasons: (1) The rarity of the disease in adult women, as most of them have had it in childhood or adolescence; (2) Absence of contamination of the child. Infection of the child takes place through the placenta, most probably at the time of the maternal measles. Congenital measles is a serious disease, especially as the child is very frequently premature and is in a state of congenital weakness.

Several papers have recently appeared on the subject of *relapses or second attacks* of measles. Loos,⁵ without denying the possibility of second attacks, has not yet seen an undoubted case, and maintains that all statements as to repeated attacks should be subjected to careful examination. He records his own experience of three supposed cases in each of which an error in fact was discovered.

G. Macciotta⁶ reports eight cases of relapse and three of a second attack of measles which he had observed in the same epidemic in the spring of 1924, when they occurred in about 1 per cent of all cases. The relapses appeared in children from 1 to 7 years old, within a few weeks of the primary attack, while the second attacks were in persons of 15 to 27 who had had measles in childhood. Macciotta attributes the occurrence of relapses and second attacks to exaltation of the virulence of the causal organism of measles on the one hand, and diminution of organic resistance on the other. A familial factor and the presence of tuberculosis were prominent features in his cases. Four of the cases were two pairs of brothers, and two were cousins. Five cases were definitely tuberculous, and in the rest tuberculosis could not be excluded. Of the three who had a second attack, one subsequently died of pre-existing tuberculosis and another showed signs of consumption.

H. W. Berinsohn⁷ states that in a series of 903 cases of measles, 16, or 1.7 per cent, gave a history of a previous attack. Of these, 4, or 5 per cent, occurred in the first year; 7, or 2.2 per cent, from 1 to 3; and 5, or 1.2 per cent within 3 and 7 years. Second attacks are therefore most frequent in the first year of life, although the incidence of measles is rare at this age, only 80 in the series of 903 being under one year. The length of the interval between the first and second attack varied in different cases. Von Starek⁸ records the case of a boy, age 2 years, who had a typical attack of measles with a very intense rash and high fever complicated by bronchopneumonia. About two years later he again contracted measles, and developed bronchopneumonia on this occasion also. Two other children in the same family had only one attack of measles. J. Vergely,⁹ who records the case of a boy, age 11, who had two undoubted attacks of measles within two years, quotes Comby to the effect that most cases regarded as second attacks are explained by errors of diagnosis, being really seasonal roseolæ, morbilliform eruptions, rubella, etc. As a general rule, second attacks of measles when they do occur are less severe than the first.

[The reviewer can also testify to the extreme rareness of a second attack of measles and to its mildness when it does occur. In the case of non-eruptive measles reported by him many years ago (*see* MEDICAL ANNUAL, 1906, p. 320) the child was said to have had a previous attack with other members of the family fourteen months before. It is noteworthy that in few, if any, of the cases on record have Koplik's spots been noted in both attacks.—J. D. R.]

W. T. Gardiner¹⁰ states that during the four years since his appointment as otologist to the Edinburgh City Hospital, 181, or 13.5 per cent, of 1331 cases of measles developed *otitis media*. Ninety-six were under 2 years of age. Although otitis occurred mainly in young persons, 8 were over 17 years of age. The onset was usually in the first or second week or did not occur until the sixth week. In the latter case adenoids were always present. Pain was complained of in the early cases, but was frequently absent in the later cases, in which discharge was the first symptom. The perforation in most cases was anterior; 5 developed a mastoid complication. Gardiner found that when adenoids were absent the middle-ear suppuration responded to conservative treatment, whereas their presence tended to keep up the discharge and render mastoid complications more likely. Their removal usually cleared up the discharge very rapidly.

J. R. Paso,¹¹ who has found records of only six other cases in the literature, reports an example of *phlebitis* of the left femoral vein in convalescence from measles, the patient being a young soldier with stigmata of congenital syphilis. The phlebitis was of the phlegmasia alba dolens type, and was accompanied by severe neuralgic pains, but subsided without complications within three weeks.

DIAGNOSIS.—Under the title of "An Early Diagnostic Sign in Measles" I. H. Goldberger¹² describes spots of a definite character on the swollen caruncle at the inner canthus similar in colour to, but smaller than, Koplik's spots. During the eruptive stage they tend to coalesce, but in the pre-eruptive period they appear as isolated pin-points from two to four in number, and bluish-white in colour. Both caruncles are usually involved. They can be seen twenty-four to forty-eight hours before the appearance of Koplik's spots, and often forty-eight hours before the catarrhal signs. Unlike Koplik's spots they do not disappear on appearance of the rash. Goldberger observed these spots in 60 per cent of his cases.

E. Steinert¹³ draws attention to the presence of white, round or comma-shaped spots on the nasal mucous membrane in the early stage of measles. They can readily be brought into view by extroverting the tip of the nose. This phenomenon, which represents an extrabuccal localization of Koplik's spots, may be found useful in the early diagnosis of measles in children who resist inspection of the mouth.

PROPHYLAXIS.—R. Debré, P. Joannon, H. Bonnet, and J. C. Decam¹⁴ have carried out more than 200 prophylactic injections with the whole blood or serum of adults who have previously had measles, and by this method have checked the extension of the disease in several families or communities where crowding facilitated contagion and might have aggravated the disease. The dose of serum below the age of 2 years was 12 to 15 c.c., and above that age 20 to 25 c.c. It is advisable to pool the serum of several individuals, since the richness in antibodies of a single serum cannot be known *a priori*. The parents are usually chosen as donors without any notice being taken of the date when they had measles, as parents who had had the disease twenty or thirty years previously supplied excellent serum. The writers suggest that the serum of adults who have previously had measles may contain immuninsins to diseases frequently associated with measles, especially whooping-cough, and may, therefore, be superior to convalescent serum.

TREATMENT.—M. B. Sindoni¹⁵ records 18 cases of measles in patients from 10 months to 19 years old treated by intravenous or intramuscular injection of Vaccine prepared from cultures of the organism described by Di Cristina and Caronia as the cause of the disease. (See MEDICAL ANNUAL, 1925, p. 270.) The result was a shortening of the attack, rapid improvement of the individual symptoms, constant recovery, and complete absence of complications.

REFERENCES.—¹*Med. Jour. of Australia*, 1925, i, 453; ²*Amer. Jour. Med. Sci.* 1925, clxix, 531; ³*Clinical Jour.* 1925, liv, 69; ⁴*Thèse de Paris*, 1925, No. 45; ⁵*Wien. klin. Woch.* 1924, 981; ⁶*Polichinico*, 1925 (Scz. Prat.), 116; ⁷*Nederl. Tijds. v. Geneesk.* 1924, ii, 1864; ⁸*Wien. klin. Woch.* 1924, 1325; ⁹*Jour. de Méd. de Bordeaux*, 1925, 370; ¹⁰*Jour. Laryngol. and Otol.* 1924, 614; ¹¹*Semana méd.* 1924, 427; ¹²*Arch. of Pediatrics*, 1924, 427; ¹³*Med. Klinik*, 1925, 846; ¹⁴*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1925, 682; ¹⁵*Pediatrics*, 1925, 172.

MEDICAL WITNESSES IN COURTS OF LAW.

Joseph Priestley, B.A., M.D., D.P.H.

The importance of the medical witness in courts of law cannot be exaggerated, according to Mr. Justice Horridge, and certainly a better authority could not be chosen. But how are medical witnesses to live up to such an ideal? The evidence of the medical witness is the handmaiden of justice. In criminal trials, from the simplest assault up to murder, the medical witness is a *sine qua non*, not only in considering the facts of the cases but also in actually judging the criminals' responsibilities for their actions. In cases concerning wills, also, the medical witness is supreme, so that a testator's doctor as a witness to his (or her) will may be a priceless asset in the event of a will being disputed. In divorce and nullity cases, the medical witness is equally supreme, as also in workmen's compensation cases, in which latter the medical witness is often medical referee of the court, and, as such, really takes part in adjudication.

In some cases, however, in which medical witnessing is important, there is a difficulty due to the fact that medical witnesses may be called on both sides—for and 'against'. To help one's client is one thing, but, in doing so, there should be no departure from the line of medical honour. All facts should be noted and given to the court, and the medical witnesses' opinions should be based upon a due consideration of the whole of such facts and without any introduced preconceptions. Though sometimes done, it is obviously absurd to come to a decision first and to consider the facts afterwards! There are such things as additional facts being brought out in the course of a trial, and these must be carefully considered by the medical witnesses, and their decisions (if necessary) revised accordingly—even at the last moment in the witness-box. Counsels' double questions should be answered each part separately, and, as far as possible, the answers should be 'Yes' or 'No'. Amplification and explanation can come at a later time, if necessary. "Refuse to answer questions on matters about which you know nothing. Say that you are not in a position to answer, and above all things speak in ordinary language, with as few technical terms as possible". Such are the words of advice given by Mr. Justice Horridge, in opening a discussion on the medical witness before the Hunterian Society recently.

MEDICATION, INTRATHECAL. (See INTRATHECAL MEDICATION.)

MELIOIDOSIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A. T. Stanton and W. Fletcher^{1,2,3} describe under this name the disease first recognized by A. Whitmore in Rangoon in 1912 and recorded by him under the term of "A glanders-like disease occurring in Rangoon," that worker having also isolated the causative organism, which the present writers call

Bacterium whitmori after him. Fifty cases have now been recorded, including 38 in Rangoon, 1 in Singapore, and 11 in Kuala-Lumpur, all the patients dying except one who recovered and one who still has ulceration after a two-years' course. The organism resembles closely the bacillus of glanders, but differs in growing rapidly on glycerin-agar in a rugose form like tubercle bacilli—although it occasionally forms a slimy mucoid film—and in the motility of the bacillus. Further, it is not pathogenic to horses even in large doses, but may be rapidly fatal to guinea-pigs, rabbits, and rats; the disease broke out spontaneously among these three classes of animals in the Kuala-Lumpur Institute for Medical Research in 1913, being apparently naturally a disease of rats, and spread by food contaminated by rats. Fourteen strains of the new organism formed a homogeneous group in their serological reactions, and in this were found to be closely allied to *B. mallei* of glanders from Mukhtesar, India, and from Java, but differed from three strains from the London Lister Institute.

Clinically the disease has only four times been diagnosed during life, by cultures of the organism being obtained from the blood, urine, or abscesses. It usually runs a rapidly fatal septicæmic course, together with acute bowel symptoms, which may make it resemble cholera, plague, enteric, general tuberculosis, or even dysentery, cultures being the only method of diagnosis.

Post mortem the characteristic lesions are small yellow caseous nodules formed of polynuclear cells surrounded by a zone of congestion, which have been found in nearly every part of the body except the brain, but most constantly in the lungs, and also in the form of abscesses in the spleen and liver, the latter having been mistaken post mortem for amœbic ones, which they closely resemble; abscesses are also met with in connection with the connective tissues, muscles, and bone, and ulceration in the cæcum.

No treatment has proved of any avail.

REFERENCES.—¹*Bull. Instit. Med. Research, Fed. Malay States*, 1924, No. 5; ²*Jour. of Hygiene*, 1924, Dec. 18, 268; ³*Ibid.* 1925, April 25, 347.

MENINGITIS, MENINGOCOCCAL. (See also INTRATHECAL MEDICATION.)

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Lewkowicz,¹ of Krakow, combats the popular theory that the meningococcus has a special affinity for the meninges, and claims that the meninges are secondarily infected through the choroid plexuses. He maintains that during the bacteræmic, premeningitic phase of the disease, a metastatic focus, analogous to the cutaneous rash, develops in one or other of the choroid plexuses. This local condition extends and becomes a choroido-ependymitis or ventriculitis.

The meningococcus is an organism which, although only feebly virulent, has a remarkable power of multiplication, and also a peculiar faculty of living in and upon the epithelial lining of the respiratory passages and of the cerebral ventricles. Its feeble power of resistance is the reason why the general blood-infection is usually of so short a duration. As soon as the slightest degree of general immunity is established, the meningococci in the circulation lose their vitality, fail to induce further metastatic lesions, and are destroyed, as evidenced by retrocession of the purpuric cutaneous rash. The strongest evidence against any special affinity of the meninges for the meningococcus is that whenever any part of the subarachnoid space becomes cut off from communication with the cerebral ventricles, e.g., by shutting off the spinal from the cerebral space by adhesions, the meningococci at once disappear from the spinal theca, and the inflammation there assumes a serous character.

In the course of cerebrospinal fever there are three stages: (1) Meningococcal gripe, liable to occur in epidemics; (2) Meningococcal septicæmia; (3)

Meningococcal choroido-ependymitis. Of these, the second stage is a transient affair, whilst the first and third may persist simultaneously for weeks and months. The first stage, affecting mainly the nasopharynx, has comparatively insignificant symptoms.

Hitherto the anatomical lesion of cerebrospinal fever has been commonly regarded as a primary purulent meningitis with possibly, but not necessarily, a secondary ventriculitis. This view was based on the fact that in the early stages of the disease the ventricular changes are slight, whilst extensive layers of purulent exudate are found covering the meninges. This pus was generally assumed to have been formed *in situ*. Lewkowicz, however, recalling the direction of the fluid current, viz., from ventricles to basal cisterns and thence to the cortical subarachnoid space, considers that although possibly some of the pus is formed *in situ* upon the meninges as a result of their receiving for absorption fluid charged with free meningococci, more usually the pus-cells derive their origin from the ventricles or other parts of the meninges, and only settle down on the arachnoid as upon a filter. The largest accumulations of pus-cells will therefore be found at the place where absorption of fluid is most active, i.e., over the frontal and anterior parietal regions of the cortex, which in the recumbent patient are the highest part of the cranial cavity. It is here that the subarachnoid venules have the lowest blood-pressure, perhaps even a negative pressure, so that in this area the fluid in the subarachnoid and perivascular spaces is most readily absorbed. For the accumulation of pus in the spinal theca, it is probable that sedimentation is an important factor.

Various modifications in the anatomical findings occur, according to the intensity of infection, the variable degree of immunization, and so forth. But the most important factor in this connection is that of cerebral oedema. In its highest degree, cerebral oedema, by circulatory disturbances, leads to death in a fulminating manner. In this acutely fatal type, ventricular puncture during life yields abundant venous blood from different depths, a sign of passive congestion, whilst at autopsy well-marked cerebral purpura is found. The lumen of the cerebral ventricles is also considerably narrowed.

If the brain is soft and flaccid in consistence, as in infants, the cerebral oedema flattens out and obliterates the cortical sulci. These sulci at once lose their connection with the ventricles, and immediately both infection and inflammatory reactions of the cortical meninges disappear. If the amount of pus already conveyed to the cortex by the stream of cerebrospinal fluid has been small, it may disappear by absorption, leaving the meninges apparently normal; or, if pus has already reached the cortex in considerable quantities, it undergoes disintegration and is replaced by connective tissue. In either case, the only part of the subarachnoid space that remains in free communication with the ventricles is the basal cisterns, which become filled up with pus. In this way is explained the posterior basic type of meningitis as seen in infants. Oedema of the brain, by producing a pressure-cone at the foramen magnum, also blocks the communication with the spinal cistern. This, together with adhesions in the membranes around the basal cisterns, explains the production of hydrocephalus from insufficient ventricular drainage.

With older patients, the brain tissue becomes progressively firmer in consistence and more resistant, so that it takes longer to produce obliteration of cortical sulci, and hydrocephalus develops less easily.

Lewkowicz claims that in cerebrospinal fever, the ventricles being the primary site of infection, Serum Treatment should therefore be directed directly into the ventricles and repeated daily for several days until the ventricular fluid becomes free from meningococci. In many cases, of course, serum administered by ordinary thecal puncture is found to be efficient; but sometimes,

owing to the presence of cerebral œdema, spinal intrathecal injections fail to reach the cranial cavity. It is therefore better to introduce the serum directly and bilaterally into the cerebral ventricles.

In addition to passive immunization by means of antimeningococcal serum, active immunity should also be aimed at. This may develop spontaneously, or it may be accelerated by **Vaccine Treatment**, so as to produce antibodies in sufficient amount in the cerebrospinal fluid. Lewkowicz records a case where repeated weekly doses of vaccine, administered hypodermically in progressively increasing doses, failed to make any appreciable impression on the number of cocci in the ventricular fluid. He then gave 16 c.c. of the patient's own serum into the lateral ventricle; this was followed by immediate and complete recovery.

Lewkowicz habitually practises both spinal and ventricular punctures in every case of meningococcal meningitis. Sometimes he has performed sub-arachnoid puncture, thereby obtaining a third fluid for examination; but he makes no mention of the cisternal route.

REFERENCE.—*Lancet*, 1924, ii, 487.

MENTAL DEFICIENCY. (*See also* DELINQUENCY AND MENTAL DISORDER.)

Henry Devine, M.D., F.R.C.P.

The prevention of mental deficiency was a subject of discussion at the 1924 meeting of the British Medical Association.¹ A. F. Tredgold pointed out that the solution of the problem of prevention must naturally depend upon our knowledge of causation, and from this standpoint cases can be divided, firstly, into those in which the defect is primarily and essentially due to an innate incapacity for normal development; and, secondly, those in which development has been arrested by some external influence. The essential cause of the first group (primary amentia) is a diminished developmental potentiality of the cerebral neuroblasts resulting from a variation of the germ plasm; it is, therefore, inherited and transmissible. This being the case, it would at first sight appear to follow that to prevent primary mental deficiency all we have to do is to prevent, by such methods as sterilization and segregation, the propagation of those who are mentally deficient. Unfortunately the matter is not so simple, and there is considerable divergence of view as to the nature of the germinal change which is the basis of this diminished potentiality, and also as to the mode of its inheritance. According to one of these views, primary amentia is a definite unit character which has arisen in various stocks as a defect mutation, and which is inherited as a Mendelian recessive. Assuming that this view is correct, Tredgold points out that it by no means follows that the condition would be eradicated by measures directed towards the prevention of propagation. On this matter he quotes Professor Punnett, who states that, assuming an initial proportion of one defective per 100 population, the segregation or sterilization of defectives would have to be continued for 22 generations to reduce this proportion to one per 1000; to reduce this one per 1000 to one per 10,000 a further 68 generations would be needed; while to carry this reduction to a proportion of one per 100,000 another 216 generations would be required. Tredgold considers, however, that the proposition that amentia is a unit defect, or combination of defects, transmitted in accordance with Mendel's laws, is far from being established, and proceeds to develop the view that there is actually no such thing as the inheritance, or transmission, of mental defect at all. What is inherited, or what may be transmitted, is a varying degree of diminished potentiality for neuronic development; there is a neuropathic diathesis, or innate tendency to imperfection of neuronic development, which is the basis of mental deficiency.

Tredgold considers that any attempt to eliminate mental defect by preventing the propagation of those who are themselves defective can only be attended with very limited results. Whatever view of the nature of the germ changes we adopt, it is evident that to produce any appreciable result we should have to prevent the propagation of all those in whom the taint is present—in other words, of all ‘carriers’ or those suffering from a neuropathic diathesis. Such compulsory prevention is not only impracticable, but impossible.

As regards the question of *birth control* in relation to prevention of mental deficiency, it is pointed out once more that restriction tends to be practised by the biologically fit, while inferior types, the thriftless and parasitic sections of the community, continue to propagate without restraint. It would appear that any general advocacy of birth control must operate still further in the same direction, and must inevitably tend to increase the ratio of those to whom it makes no appeal, or who are lacking in the prudence and control to apply it; and since neuropaths form a large proportion of this class, it may tend to an increase and not a decrease of mental defect. What is needed at the present time to restore the balance and conduce to human progress is not the indiscriminate advocacy of birth control, but the encouragement of the multiplication of the biologically sound, and the discouragement of the multiplication of the unsound.

As regards *sterilization*, Tredgold considers that there is a tendency to attach an importance to this subject in excess of that which it really possesses; it has been advocated in terms which suggest that it has only to be adopted to bring about a complete elimination of mental defect. The most that sterilization can do is to prevent that relatively small proportion of defectives who are the offspring of defective parents. It would enable aments with antisocial propensities to be at large, and it is probable that sterilized defectives would increase sexual assaults and encourage promiscuous sexual intercourse, with a consequent increase of mental disease.

Segregation, which has none of these disadvantages, is regarded by Tredgold as much preferable to sterilization. In conclusion, he suggests that the ‘devitalization’ of the germ plasm, which reveals itself in various abnormalities of the nervous system, and which reaches its culminating manifestations in amentia, is the result of adverse conditions of the environment, or possibly of some disturbance of endocrine balance.

In the interesting discussion which follows this paper, E. Pritchard points out that Tredgold’s view that many cases of hereditary defect are the expression of ‘devitalization’ from damage to the germ plasm is the same as Professor Forel’s ‘blastophoria’. He refers to the feeding experiments of McCollum and others, conducted through several successive generations on colonies of animals, which have indicated that the cumulative influences of wrong feeding can produce far-reaching effects on growth and powers of reproduction. He is of the opinion that the influence of iodine in cretinism, the influence of maize and various biologically defective proteins in the production of pellagra, and the influence of the water-soluble B factor in the production of the beriberi type of neuritic degeneration, indicate that there must be elements in the food which have a selective influence on nerve elements and their representatives in the germ plasm. A study of such influences acting, perhaps quite mildly, through successive generations may actually lead to the discovery of the unknown causes of the devitalization of the germ plasm which leads to mental defect and degenerate offspring.

W. A. Potts states that his experience confirms Tredgold’s view that mental defect is not a unit character, having found that it is insanity which precedes amentia more often than amentia itself. In supporting the theory of

devalitalization, he refers to three factors in particular which exert an unfavourable influence: (1) Toxic infection in pregnancy; (2) The injurious effects of rapid succession of children; and (3) The injudicious or unskilful use of forceps.

R. Hutchison also considers that greater antenatal care and better obstetrics might lessen the number of mental defectives, but he criticizes Tredgold's view of the inheritance of mental deficiency, and states that he has not been able to find that the family history in his cases of mental deficiency has been any worse in respect to neuropathic heredity than that of the average normal child. He has been particularly impressed with the clinical fact that in two-thirds of the cases the child was the first-born in the family. He points out, however, that this does not help us at all in the prevention of primary amentia—unless, indeed, we are prepared to imitate Herod and kill off all the first-born. Possibly the difficulty of the first labour may account for the high proportion of aments amongst the first-born. He finds, also, that the evidence for environmental factors acting on the germ plasm is unsatisfactory, and expresses the view that mental deficiency arises as an unfavourable variation which is not more inherited than (say) hare-lip. In spite of the value of segregation, he believes that if all defectives were segregated each generation of normal stock would still produce its quota of them, just as it does of individuals of exceptional ability.

An important legal opinion on sterilization was elicited from Travers Humphreys by the British Medical Association.² The Association was advised by counsel that from the legal point of view the question raised is free from doubt and admits of only one answer. Any medical man who performs the operation described upon a 'defective' within the meaning of the Mental Deficiency Act would, in the present state of law, be acting illegally. Assuming the consent of both parents and the excellence of the motives of all concerned, the fact remains that the operation of sterilization involves an assault upon and the wounding of the person operated upon. The only legal justification for such action in regard to a person who either from extreme youth or old age or from any other cause such as mental weakness is incapable of giving a reasoned consent would be that the operation was necessary to the health or well-being of the patient.

The importance of *segregation* as a measure for the prevention and treatment of mental deficiency is recognized by all concerned with these problems. In the case of high-grade defectives, upon whom the deprivation from the pleasures of life weighs heavily, it is of the greatest importance that they should be cared for under the most favourable conditions possible. On these grounds it is gratifying to record that the Board of Control have issued a pamphlet to local authorities stating that new buildings intended for the care of mental defectives should be designed as a *small village or colony*. A proposal to erect an institution on the barrack system, providing one large block for each sex, will not be approved. It is much to be hoped that a similar principle will be adopted in regard to the erection of future hospitals for the insane.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 316; ²*Ibid.* (Supplement) 1925, i, 286.

MENTAL DISEASE. (See also DELINQUENCY AND MENTAL DISORDER; INSOMNIA; MONGOLIAN IMBECILITY.) *Henry Devine, M.D., F.R.C.P.*

PATHOLOGY.

There is an increasing tendency to approach the problems of psychiatry from the standpoint of biology, pathology, and general medicine, as it is recognized that the symptoms observed in mental disease must be the expression of a morbid or mal-functioning physical organism. It is recognized,

moreover, that the mind cannot be considered as an entity, in detachment, as it were, from the body, nor even as the exclusive function of the brain; rather must it be viewed as a function of the whole organism, having its roots in the endocrine glands, the viscera, vegetative nervous system, and musculature. All psychic processes must be regarded in their ultimate analysis as dependent on somatic processes, and, indeed, modern psychology and psychopathology, which have ceased to be concerned exclusively with the description and analysis of conscious mental states, lead us straight back to the fundamentals of organic life by their insistence on the influence of instincts, autonomic cravings, and affections as motivating factors of human behaviour. In forms of mental illness such as general paralysis and lethargic encephalitis the dependence of personality changes upon somatic disease is clearly demonstrable, but in others it is not so evident. Even the most delicate post-mortem histological studies may fail to account for the symptoms of many serious forms of mental disorder, and it is quite to be understood that the organic disturbances responsible for the subtle affective distortions occurring in (say) paranoia would not be susceptible to demonstration under the microscope. A more promising line of investigation is found in the study of the physiological processes in the living subject with a view to discovering whether and in what respects these differ from the normal in those suffering from mental disease, and researches along these lines are now largely occupying the attention of pathologists.

Isabella M. Robertson¹ has undertaken an interesting research of this kind on the *vasomotor reactions in mental disorder, with special reference to the hæmoclastic crisis*. This vascular-sanguinary crisis is characterized by leucopenia, fall of blood-pressure, inversion of the leucocytic formula, hypercoagulability of the blood, and diminution of the refractive index of the serum. To demonstrate the presence of the hæmoclastic crisis, 200 grm. of milk are administered to a subject who has fasted for several hours. The leucocytes and differential leucocytes and the blood-pressure are noted before the milk is taken, and again at intervals of twenty minutes afterwards. In the normal subject there is a hyperleucocytosis, while the blood-pressure either remains unaltered or tends to rise. In subjects who show the hæmoclastic crisis, the phenomena generally reach a maximum forty minutes after the ingestion of milk, being succeeded one and a half hours after by a phase of hyperleucocytosis and hypertension. To determine the occurrence of the hæmoclastic crisis, experiments were undertaken on 100 normal subjects, 90 certified patients, and 275 uncertified and neurotic patients. The results obtained are of considerable interest. The hæmoclastic crisis occurred in 94 per cent of dementia præcox patients, in 85 per cent of melancholias, and in 75 per cent of chronic mania cases. In the early psychotic and neurotic patients, 135 exhibited a hæmoclastic crisis, 106 a leucocytosis, and 34 an indeterminate reaction. In the last group a consideration of the subsequent progress of 65 of the cases who manifested the hæmoclastic crisis shows that 16 are reported as better, 13 *in statu quo*, and 7 as worse. Of 17 indeterminate cases, 7 are reported better, 3 *in statu quo*, and 7 as worse. The reports of 66 cases which gave a normal reaction show that 47 are better, 12 *in statu quo*, and 7 worse. In commenting on these figures, the writer observes that, while they are probably inaccurate, such evidence as there is tends to show that there is some prognostic value in the presence or absence of the hæmoclastic crisis, in these patients.

J. Walker² writes on *basal metabolism in mental disorders and the influence of the diathermic current on the same*. The data on which the research is based have been obtained from over 200 estimations of the basal metabolic rate in 44 cases of mental disorder, 30 of which were the subjects of dementia præcox.

Of the cases of dementia præcox examined, 50 per cent showed a subnormal basal metabolism, the average rate being 20 per cent less than the normal. No material change followed the administration of thyroid-gland extracts, and it is suggested that the diminution of the oxidation processes in the body tissues is due to a hypofunction of the nervous system, particularly in the autonomic, and not to thyroid disorder primarily. During remission in the course of dementia præcox the basal metabolism approaches that of the normal individual. In the cases of mental disorders other than those belonging to the dementia-præcox class, there was no deviation of the basal metabolism from the normal, except in one case where there was hyperthyroidism. The heat produced by the general application of the Diathermic Current is endogenous, and has increased the basal metabolism on an average of about 10 to 15 per cent in all the cases so treated. The intensity of the reaction produced varied with the duration of the treatment. The writer recommends diathermy in conjunction with other measures as a useful mode of treatment in cases of mental disorder where there is a subnormal basal metabolism.

J. C. Whiteborn and K. J. Tillotson,³ writing on *oxygen consumption in dementia præcox*, reach similar conclusions to the above. They state that persons suffering from dementia præcox tend as a rule towards significantly slower rates of oxygen consumption under approximately 'basal' conditions than would normally be predicted, and that these slow rates are quite persistent in individual cases.

K. K. Drury and C. Farran-Ridge⁴ have published investigations on the *types of blood-sugar curve found in different forms of insanity*. The sugar tolerance of 100 insane patients was determined by observing the variations in the blood-sugar content after the ingestion of a known amount of glucose. For the blood estimations Calvert's method was used. In a large proportion of cases the curves were found to vary greatly from the normal, and the following conclusions are drawn from the research: That the general metabolism is far more disordered in insanity than one would be led to believe by casual observation; that, amongst the mental symptoms, confusion and melancholia are associated with the greatest disturbance of the sugar metabolism; that the sugar metabolism in epilepsy, in the quiet stages, approximates more closely to the normal; that the renal threshold level is very variable, and that consequently from the absence of sugar in the urine one cannot draw any conclusion as to the fasting level percentage of sugar in the blood.

ETIOLOGY.

Focal Infection and Mental Disorder.—In connection with this subject reference may be made to an interesting symposium on focal infections and mental disorder, comprising contributions from two laryngologists, a general physician, and a dental surgeon. P. Watson-Williams⁵ is of the opinion that nasal, aural, and other focal infections often constitute the essential causes of functional psychoses, ranging from slight impairment of intellectual activity, through the more definite forms of mental taciturnity, inability to concentrate, and the varying syndromes of psychic abnormality grouped under the terms 'neurasthenia' and 'hypocondriasis', to the grave manifestations of mental disorder of certifiable intensity. He quotes two cases, one the subject of a mild depression with inadequacy, and the other of a severe depressive psychosis, in which exploration and draining of the nasal sinuses was followed by eventual recovery from the mental symptoms. Emphasis is laid on the latent character of the focal sepsis in many patients who are nevertheless the worst sufferers from chronic toxæmia, and it is observed that there is often an absence of pain or other symptoms drawing attention to the real source of

infection; that patients with chronic purulent discharge seldom suffer from toxæmic symptoms as compared with those with but little discharge; and that this discharge is often non-purulent to the naked eye. A contribution by E. Watson-Williams to the symposium deals with aural sepsis as a source of neurasthenia and insanity, excluding local manifestations in which tinnitus aurium or intracranial complications were associated with morbid mental states. Cases are quoted in which otorrhœa was complicated with mental symptoms and in which the latter cleared up following mastoid operations. J. A. Nixon quotes four cases from his experience as a consulting physician in which chronic septic absorption appeared to be a definite factor in the causation of abnormal mental reactions: the first, a melancholic in whom the treatment of a severe and prolonged state of constipation was followed by mental recovery; the second, a manic patient in whom the mental symptoms cleared up subsequent to treatment for infection of the urinary tract; the third, a melancholic who recovered after treatment for a septic mouth; and the fourth, a suicidal depressive patient who recovered after three sources of septic infection—dental sepsis, nasal sinus disease, and chronic appendicitis—had been submitted to surgical treatment. W. R. Ackland cites three cases in which mild psychoses were associated with serious dental disease. Radical treatment of the physical condition was followed by complete restoration to mental health in each case.

J. Walker⁶ reports on three cases of mental disorder due to *toxæmia of the bowel*. In all the cases the alimentary tract, following a barium meal, was radiographed. In the first there was marked delay in passage through the colon, and it was fifty-four hours before any of the barium had reached the rectum; in none of the films was barium seen in the middle part of the descending colon. In the second, the stomach was so proptosed as to be lying deep in the pelvis, was atonic, and showed delay in emptying; there was stasis at the ileocecal junction and in the colon. In the third, there was marked atony of the stomach, with proptosis, delay at the ileocecal junction, and stasis in the colon with spasticity. Treatment, which promoted recovery in all cases, consisted in such measures as **Saline Purges, Milk Diet, Liquid Paraffin, Lavage of the Colon, Kerol in Capsules, and Diathermy**. The following deductions are made from these studies: (1) The nervous system is susceptible to the influence of toxæmia of either exogenous or endogenous origin; (2) Toxæmia of intestinal origin is more frequent than is generally accepted, its deleterious action being more marked when either the general health is reduced by previous illness, or the powers of resistance are reduced by such agencies as heredity, personal neglect, malnutrition, and unhealthy environment; (3) If the toxæmia has not produced definite organic changes, it is safe to give a good prognosis. When recovery is complete, an attempt should be made to instruct the patient in personal hygiene with a view to lessening the chances of recurrence.

R. V. Stanford and E. Goodall⁷ report researches on the *passage of a barium meal in 24 cases of mental disorder*. Instantaneous exposures were taken under identical conditions with the patient in an upright position. A meal containing 4 oz. of barium sulphate was given after preliminary clearance of the bowels, and radiograms were taken at 0, 1, 4, 7, 24, and 48 hours after. Only 2 of this series were possibly free from abnormal states of the gastro-intestinal tract, the evidence pointing to stasis, to ptosis of the transverse colon, and spastic contractions of the same in many instances.

Another aspect of this subject is discussed by G. W. Henry,⁸ who made a series of roentgenological observations on 100 cases to show that visceral position, tonus, and motility are affected by different types of psychosis, regardless of variability due to habitus. They were classified according to mental condition

and for 'build', weight, and tension of the abdominal wall. In the manic phase of the affective psychoses there was a tendency towards normal position, hypertonic tonus, and normal mobility; in involuntional melancholia, and in depressed cyclothymics, just the opposite. Catatonic cases showed normal position, hypertonicity, and hypermotility; paranoid dementia præcox the same, except for more marked hypomotility than in depressions. Paranoid states showed higher position, greater tonus than dementia præcox, and slight hypomotility. In the relation of gastro-intestinal functions and psychoses, the author considers there is too little evidence for considering either of them cause or effect; a psychosis is a change in the entire individual rather than merely an abnormal functioning of the brain or of the central nervous system. This is not the place to discuss this question, but it may be pointed out that the intestinal disorders described by these various writers may be, in some instances at any rate, resultants rather than causes of the mental illnesses in which they occur. Mental disorder is a disorder of behaviour, a defect in adjustment of the individual to life, and it is evident that the nature of the abnormal behaviour is of such a kind as to favour the occurrence of intestinal stasis and toxæmia. Whatever may be the nature of the fundamental processes responsible for the clinical syndromes of insanity, it is clear that the symptoms are largely 'psychological' in origin; that is to say, they are reactions to attitudes, emotions, fears, and delusions. Neglect of or a refusal to attend to physiological functions are essential symptoms in many psychoses; and just as a refusal of food in a psychotic is due, not to dyspepsia, but to perverted mental states, so the 'constipation' in (say) a precocious dement is only part of his general negativistic attitude—it is due, that is, not to physiological disturbances, but to an active refusal to evacuate the bowels. Refusal of food, of course, leads to secondary physiological disorders, as may, also, the negativistic attitude in dementia præcox.

H. A. Cotton,⁹ who has been a strong advocate of the view that the so-called functional psychoses are caused by cerebral toxæmia arising from chronic infections in the teeth, tonsils, gastro-intestinal tract, and genito-urinary system, contributes another article on the subject. He emphasizes particularly the influence of intestinal toxæmia due to chronic intestinal stasis located in the colon. In treating the condition, the colon was formerly resected, but on account of the high mortality-rate (30 per cent) Lane's original method of releasing the acquired bands which obscure and obstruct the colon has now been adopted. The writer reports that, out of 160 cases operated upon by this method, mental recovery occurred in 99 cases, the mortality-rate being under 10 per cent.

Cotton's views and methods have aroused considerable opposition and criticism, and a critical study of his work by Kopeloff and Kirby was referred to in the 1925 MEDICAL ANNUAL (p. 285). A. T. Hobbs¹⁰ has also written a paper wherein he gives a survey of *American and Canadian psychiatric opinion as to local infections (or chronic sepsis) as causative factors in functional psychoses*, in which the work of Cotton is submitted to criticism. As a profession we should be progressive, and adopt all the methods that will improve or cure our patients. Time is an important element in their recovery, and we should not terminate too early the skilful care of the trained psychiatrist and good nursing in an effort to produce startling cures, only to be disillusioned in the future. Such a view probably represents the feelings of most psychiatrists in regard to this subject.

Mental Symptoms in Paralysis Agitans.—G. B. M. Free and H. V. Pike¹¹ report five cases of this disease associated with marked psychic symptoms. They state that mental symptoms often precede the neurological signs and

lead to erroneous diagnosis. The mental manifestations are characteristic, and consist of emotional depression; agitation and psychic pain; hallucinations, generally referable to the organic sensations and the sense of touch; delusions of a somatic, self-accusatory, or paranoid nature, with resultant attempts at homicide or suicide; and varying defects of memory, with little confusion.

TREATMENT.

Psychotherapy (see also p. 326).—C. Odier¹² classifies the contra-indications and indications for treatment by **Psycho-analysis**. Dementia præcox, paranoia, organic psychoses, involutional melancholia, and manic-depressive insanity are not amenable to psycho-analysis, and this treatment is contra-indicated in simple neurasthenia, traumatic psychoses, hypochondria, psychopathic personalities of the paranoid and schizoid types, in patients over fifty, in unintelligent types, and in the non-co-operating patient. It is generally indicated in compulsion neurosis, conversion hysteria, and anxiety neurosis. Those who suffer from morbid timidity, feelings of inferiority and inadequacy, and stammer, are responsive to psycho-analysis, which is also efficacious in perversions, sexual troubles such as impotence and ejaculation præcox, enuresis, night terrors, neuroses involving the alimentary tract, and alcoholism and dipsomania.

A. F. Riggs and W. B. Trehune¹³ disagree with the emphasis laid by Babinski on suggestion and by Freud on the sex instinct, and they discount the influence of endocrine disturbances, infections, and fatigue in the production of the neuroses. They advocate the **Intellectual Re-education** of nervous patients. Their treatment averages twenty-six days in duration; the patients are housed in small inns, under the care of a nurse without uniform, and are put on to a daily routine, including sport, occupation, and reading. Re-education is undertaken by means of conferences with the physician, lectures, and literature. Emphasis is laid on the value of the intellectual as opposed to the emotional, and the patient is given some idea of the functional nature of his symptoms and how to deal with them. It is natural that such measures would be effective in certain cases, but the writers' explanation of the mechanism of the cure would seem to be inadequate. The mind cannot be split into fragments or faculties for therapeutic purposes, and a process of re-education requires the co-operation of the whole of the personality for it to lead to success. Logic has no power to cure, and the appeal to the intellect alone cannot heal a neurosis. To be effective, all forms of psychotherapy must aim to widen the range of consciousness; to develop not only thought, but action as well; to enlarge the heart as well as the head; and to direct the interest of the patient away from himself towards the busy world of reality.

F. G. Crookshank¹⁴ contributes a useful article on the *psychological interest in general medical practice*. He points out the importance of not only approaching a sick man from the purely physical standpoint, but also as a personality. It is often quite as necessary to understand the psychical situation of a patient as it is his physical condition. He briefly indicates the current theories of the causation of functional nervous illnesses, and expresses the opinion that for the general practitioner it is the technique, and in a great measure the theory, of Adler—the theory that all conflicts reduce to a conflict between the superiority claim and the inferiority realization—that is most useful at the outset.

Occupational Therapy.—The value of **Occupational Treatment** as an aid to the rehabilitation of the insane is obtaining increasing recognition amongst psychiatrists, and a considerable body of literature dealing with this subject is now available. D. K. Henderson¹⁵ gives an interesting account of the development of this treatment at Gartnavel Mental Hospital. He points out that the majority of psychotics are aware of being social failures, and, however

they may attempt to compensate, their innermost reaction is one of hopelessness. Nothing is more potent in increasing a patient's self-esteem than an ability to accomplish something, and it is therefore essential to establish well-co-ordinated, purposeful ways of doing things, instead of idleness, apathy, or inadequate reaction. The patient's day must be organized and planned, so that adequate time is provided for work and rest and play, so that interests are stimulated and exteriorized.

Early Treatment.—There is general agreement that the existing provision for the treatment of incipient, mild, and recoverable cases of mental disorder is inadequate. For the industrial classes needing in-patient treatment for mental trouble, there is no provision apart from the Poor-Law institutions and mental hospitals. There is a serious need for further means of treatment, and for more flexibility in arrangements for dealing with these cases. Fortunately experience of the treatment of cases in clinics, general hospitals, and out-patient departments is increasing, so that the extent of the existing need can be gauged, and the kind of provision most suitable to meet it estimated.

M. W. Peck¹⁶ discusses the question of *psychotherapy as a practical measure in out-patient work*, basing his views on experience gained at the Boston Psychopathic Hospital. It is generally recognized that a psychiatric out-patient department is of value as a consultant centre, where problems of mental illness and abnormal behaviour can be evaluated and advice obtained for their management and disposition. As regards actual treatment, many psychiatrists are of the opinion that very little psychotherapeutic work can be undertaken in an out-patient department. The writer, however, has found it possible to carry out systematic and efficient therapy in out-patient work where the medical personnel are interested in the procedure and the size of the clinic is not too great. In method, reliance must be placed chiefly on suggestion and persuasion, though in many cases a superficial mental analysis aids in the determination of psychogenic mechanisms and is a valuable supplement to other forms of treatment. Technical psycho-analysis is impracticable for other than a few selected cases unless there be physicians available who can give their time to the work and be free from other obligations. The histories of a few cases treated in the clinic are given, to represent the type of adult patient which can be helped by psychotherapy. The writer submits the following opinions in regard to psychotherapy: It is a potent and useful method in the treatment of human illness; in the psychoneuroses it must be the main reliance in treatment; and it is probable that there is no disorder of body or mind in which some degree of psychotherapy may not profitably be added to the other measures employed. Various methods may be adopted, ranging from simple reassurance and sympathetic optimism to those based upon highly technical psychological studies. Most of the psychotherapy indicated does not belong to the specialty of psychiatry, but should be applied, as in fact it always has been, by the general practitioner; but the psychiatrist should be competent to bring to bear a more specialized technique in difficult cases. Psychotherapy should, as far as possible, be standardized and taught to medical students as are other methods of medical treatment.

J. D. Comrie¹⁷ gives an analysis and commentary of cases treated in connection with the wards in the Royal Infirmary, Edinburgh, reserved for cases of early mental disease and incidental delirium. In view of the divergence of opinion as to how far it is possible or advisable to treat mental cases in a general hospital, the record of his experience is of considerable interest. The 500 cases treated comprised alcoholics, melancholias, confusional states, dementias, psychoneuroses, cardiac deliria, mania, gross cerebral lesions, fixed delusional states, and primary mental defect. The proportion of cases discharged

sufficiently well to return home was 72 per cent of the total. These figures naturally exceed those relating to the discharges in mental hospitals, as the clinical material, which consisted largely of alcoholic cases and toxic deliriums, differs very markedly from that dealt with in mental hospitals. A bad family history was found in the depressive cases, but in the majority of the cases it was impossible to attribute the cause to any one factor, a complex consisting in part of poor physical development, over-work, and difficulty of adaption to surroundings being usually present. In addition, a number of cases showed some definite toxic influence which might be regarded as a precipitating cause of the attack for which the patient was admitted. These included a septic condition of the mouth, general alimentary disorder with constipation, thyroid-gland disorders, and various preceding febrile conditions. The writer observes that while a definite toxic precedent could be traced in 45 per cent of these cases, it was sometimes difficult to say whether the toxic condition should be regarded as the cause or as one of the results of the general physical and mental debility.

The Treatment of Mental Disorder on a Voluntary Basis.—E. Mapother¹⁸ outlines his views as to the advantages and limitations of treatment on these lines. His opinions are based on eighteen months' experience as Medical Superintendent of the Maudsley Hospital. This clinic is devoted entirely to treatment on a voluntary basis. Every patient is required before admission to sign a form of application which clearly intimates his right to leave the hospital within twenty-four hours of giving notice of desire to do so. No patient is admitted under certificate or is certified in the hospital either for retention there or for transfer to a mental hospital. The purposes of the hospital are four—namely, research, teaching, provision of facilities for diagnosis, and curative treatment. The experience gained at the Maudsley Hospital, together with experience of the value of similar clinics in other countries, and an appreciation of the inadequacy of the existing facilities for the treatment of mental disorder, all tend to show that voluntary psychiatric hospitals are seriously needed in every urban district. Such clinics would function as centres from which all psychiatric activities could radiate, and would serve to co-ordinate work carried out at present by different local authorities and voluntary associations. As a consulting centre alone such a clinic would be found invaluable.

REFERENCES.—¹*Jour. Ment. Sci.* 1925, July, 386; ²*Ibid.* 1924, Jan., 47; ³*Boston Med. and Surg. Jour.* 1925, June 25, 1254; ⁴*Jour. Ment. Sci.* 1925, Jan., 8; ⁵*Brit. Med. Jour.* 1925, ii, 9; ⁶*Lancet*, 1924, ii, 1058; ⁷*Brit. Jour. Radiol.* 1924, Feb.; ⁸*Amer. Jour. Psychiat.* 1924, April, 681; ⁹*Practitioner*, 1925, May, 335; ¹⁰*Jour. Ment. Sci.* 1924, Oct., 542; ¹¹*Arch. Neurol. and Psychiat.* 1923, vi, 680; ¹²*Rev. méd. de la Suisse Rom.* 1924, xlv, 83; ¹³*Amer. Jour. Psychiat.* 1925, iv; ¹⁴*Psyche*, 1925, April, 296; ¹⁵*Jour. Ment. Sci.* 1925, Jan., 59; ¹⁶*Boston Med. and Surg. Jour.* 1925, June, 1151; ¹⁷*Brit. Med. Jour.* 1924, ii, 551; ¹⁸*Lancet*, 1924, ii, 897.

METATARSALGIA. (See FEET, PAINFUL.)

MILK ADULTERATION.

Joseph Priestley, B.A., M.D., D.P.H.

An important case has been decided by the courts, definitely settling what has been in the past a difficulty, viz., the responsibility for serving out to customers milk which is deficient in fat on account of the well-known fact that cream rises to the top, and that, consequently, a churn furnished with a tap two-thirds or so down from the top might be the means of milkmen selling to customers milk (if taken from such churn after standing, and from such tap) not of the nature, substance, and quality of the article demanded. The case is *Bridges v. Griffin* (Div. Court 233, Vol. ii, K.B.D., 1925). The appeal to the

cow' is not available in such a case. It is clear that a mixer becomes compulsory, and some sort of arrangement should be made by which, on turning the tap, the mixer is put in motion automatically.

This decision of the court is given none too soon, and will, undoubtedly, help to equalize the quality of the milk distributed in the future—an important consideration. The Government standard is low enough, and nothing should be allowed to interfere with, or to prevent, customers obtaining at least such a low standard as an absolute *minimum*. It makes all the difference to babies, children, and invalids, who depend chiefly upon the fat-content of the milk. It is really extraordinary that the Courts should only have been called upon to decide the point in 1925, though the fact has been known by the experts for ages and ages—long before the introduction of the Milk Regulations and the Government standard.

MONGOLIAN IMBECILITY.

Reginald Miller, M.D., F.R.C.P.

The increase in the number of Mongolian imbeciles since the war has been very obvious. T. Brushfield¹ finds that the average number of Mongols admitted to the Fountain Mental Hospital, excluding 1914–18, was 5, whereas during the years 1914–15–16–17 the average was no less than 14. Probably economic conditions necessitating institutional treatment have exaggerated the apparent increase, but the difference in the numbers seems too large to be explained entirely on these grounds. The causation of Mongolism has always been obscure, the general tendency being to regard the abnormality as likely to occur when the reproductive faculties of the parents are ebbing. Brushfield's figures are interesting: out of 96 cases the father's age was 40 or over in 64 instances, and the mother's age was 39 or over in 64 cases. D. M. Berry² inclines to take the view that the sexual enfeeblement is more marked on the paternal than the maternal side, but both authors agree that war conditions have given rise to an increase in the incidence of Mongolism. Similarly both agree that syphilis plays no part in causation.

Brushfield gives a detailed description of the characteristic physical marks of Mongolism, accompanied by excellent illustrations, two of which are reproduced here (*Plate XL*), showing the typical appearance of these children. The condition is easily to be distinguished from cretinism by various points which Brushfield summarizes in the following table:—

MONGOL.	CRETIN.
1. Condition noticed at birth	1. Not noticed until fourth to seventh month after
2. Skull brachycephalic—average cephalic index 85 in 126 cases	2. Skull dolichocephalic—average cephalic index 78 in 22 cases
3. Palpebral fissures upwards and outwards in the majority	3. Palpebral fissures horizontal
4. <i>Strabismus constant</i>	4. <i>Strabismus uncommon</i>
5. Blepharitis very common	5. Blepharitis not common
6. Tongue fissures and enlarged papillæ	6. No fissures in tongue
7. Skin smooth	7. Skin dry, folds olive-tinged, baggy under eyes and chin, pads of fat on the neck
8. Hands: fingers short, taper at ends	8. Hands stumpy, fingers square at tips
9. Feet: toe-gap between first and second	9. Feet: skin redundant about ankles
10. Expression <i>vivacious, mobile, imitative</i>	10. Dull, apathetic
11. Nose generally pinched, squat	11. Nose pug, expanded alæ
12. Whole face 'Mongolian'	12. Whole face coarse, heavy features
13. Administration of thyroid has little or no effect	13. Effect of thyroid treatment very great

REFERENCES.—¹*Brit. Jour. Child. Dis.* 1924, 241; ²*Ibid.* 259.

PLATE XL.

MONGOLIAN IMBECILITY



Fig. A.—Mongolism. Showing palpebral fissures sloping outwards and upwards, and open mouth with cracked lips.



Fig. B.—Mongolism. Showing fissures of tongue.

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MUMPS.*J. D. Rolleston, M.D.*

ETIOLOGY.—Y. Kermorgant¹ inoculated monkeys with the centrifugalized clot obtained from lavage of the buccal cavity of mumps patients with saline solution. The inoculation was made either directly into the right parotid or into the buccal orifice of the duct. After an incubation period of seven to ten days, a bilateral parotitis developed, accompanied in one case by inflammation of the submaxillary and lachrymal glands, and a well-marked meningeal reaction. Inoculation of the clot on an anaerobic medium showed a special spirochæte and a motile bacillus. The presence in the serum of patients who had recovered from mumps of an agglutinin and lysin specific for the spirochæte found confirmed its rôle in the etiology of human mumps. In a subsequent communication Kermorgant² states that cultures about one month old are best suited for the study of the morphology and various modes of reproduction of the spirochæte.

SYMPTOMS AND COMPLICATIONS.—A. Patrick³ records a case of *acute diabetes* following mumps in a girl of 8 years, who was admitted to hospital in a state of coma. Five weeks previously she had had an ordinary attack of mumps without any abdominal pain suggestive of pancreatitis. A fortnight after the attack of mumps she began to pass a large quantity of urine and had nocturnal pollakiuria. A specimen of urine obtained by catheter showed 8 per cent glucose and much aceto-acetic acid. Death took place within thirty-six hours of the onset of the coma. Patrick remarks that no abdominal pain is present in the ordinary type of pancreatitis complicating mumps. It was absent in the cases of Gillespy and Holder, Harris, and his own, which are the only three instances on record in which diabetes seems to have developed after mumps. [To these may be added the case of transient diabetes mellitus following mumps reported by Labbé and Debré (*see* MEDICAL ANNUAL, 1923, p. 300.—J. D. R.)]

P. Maisondieu⁴ exemplifies the rarity of *joint affections* in mumps by the fact that out of a total of 1334 cases of mumps only 6 developed this complication. As a rule mumps rheumatism is a late affection, occurring from fifteen to twenty-nine days after disappearance of the parotid swelling. In such cases, however, its connection with mumps is shown by the persistence of other complications such as orchitis or a subfebrile temperature. Two distinct types of mumps rheumatism have been described. The first is an arthralgic form in which several joints are affected at the same time without any obvious reaction of the synovial membrane, while the second is a monarticular form in which, in addition to pain, there are considerable swelling, redness, heat, and signs of peri-articular effusion which may even end in suppuration. As a rule, however, complete resolution takes place.

In contrast with the frequency of orchitis there are remarkably few instances on record of ovarian or mammary involvement following mumps. H. C. Berger,⁵ however, who reports a case of *oophoritis* following mumps in a girl of 6, is of opinion that the complication is much more frequent than the literature would indicate, and attributes its supposed rarity to the fact that the female genital organs are less accessible to examination. Local pain in the region of the ovaries occurs most frequently at the height of the disease. The age at which mumps oophoritis most often occurs is ten years, but it may develop in younger girls and be mistaken for appendicitis.

Izard and Canis⁶ record a case of mumps in a young soldier complicated by *peripheral facial paralysis*, the intrapetrous branches of the nerve being unaffected. They attribute the paralysis to a basilar meningitis which was manifested by an excess of albumin and slight lymphocytosis in the cerebrospinal fluid.

PROPHYLAXIS.—Several clinicians, such as J. C. Regan,⁷ V. de Laverigne and P. Florentin,⁸ and Teissier,⁹ have recently employed with excellent results the **Serum of Patients Convalescent** from mumps: (1) For the prevention of the disease in those who had been exposed to it, as had already been done by Debré (see *MEDICAL ANNUAL*, 1925, p. 295); and (2) For the prevention of orchitis in mumps patients. Regan suggests that, in order to modify the disease, and particularly to avoid orchitis, without preventing the development of the disease altogether, the serum should be injected late in the incubation stage, as had been done in the cases of measles by Debré and Ravina (see *MEDICAL ANNUAL*, 1924, p. 277). A more lasting and possibly permanent immunity is thus conferred by an abortive attack, whereas the immunity afforded by early injection of convalescent serum is only transient.

TREATMENT.—H. L. Fougousse¹⁰ treated 20 cases of orchitis which occurred among 100 mumps patients in a station for recruits by **Diathermy**. The treatment lasted half an hour each day, and the results were invariably satisfactory. Practically all pain subsided during the first treatment, and resolution was much hastened in all cases.

REFERENCES.—¹*Comptes rend. Acad. d. Sci.* 1925, clxxx, 1298; ²*Comptes rend. Soc. de Biol.* 1925, xcii, 1434; ³*Brit. Med. Jour.* 1924, ii, 802; ⁴*Thèse de Paris*, 1924, No. 519; ⁵*Arch. of Pediatrics*, 1925, 253; ⁶*Gaz. des Hôp.* 1925, 724; ⁷*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 279; ⁸*Bull. de l'Acad. de Méd.* 1925, xciii, 362; ⁹*Ibid.* 369; ¹⁰*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 117.

MYASTHENIA GRAVIS. (See EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

MYCOSIS FUNGOIDES.

E. Graham Little, M.P., M.D., F.R.C.P.

E. A. Oliver¹ reports three cases of this disease appearing as tumours without any previous eruption; the first case was in a woman, age 80, in whom the eruption of nodules had been noted a year previously. They appeared in crops, at first on the left leg, ulcerating rapidly, and in many cases healing with pigmented scars (*Plate XLI, A*). The blood-count showed no abnormality. The eruption increased in extent; and the patient died from exhaustion three years after the disease had commenced.

The second case was in a man of 39. Itching had been present for some years before the development of tumours; but no eruption had been noted prior to the development of bluish-red nodules scattered over the lower limbs. The blood-count showed no abnormality. Large ulcerated areas developed (*Plate XLI, B*). It is recorded that this patient benefited much by treatment, which is not specified, but that notwithstanding he committed suicide.

The third case was in a white man, age 41. He had a large tumour on the left leg, which was said to have begun five months previously as a small ulcer. This ulcerated extensively, with enlarged glands, and rapid loss of weight. He died of pneumonia two months after admission. In post-mortem examination metastases were found in the scrotum and intra-abdominal lymphatic glands. The pelvic peritoneum was studded with small yellowish white nodules, presenting a white fleshy surface on section.

J. F. Fraser² contributes a careful paper on this subject based on the study of three cases which clinically were regarded as mycosis fungoides but showed pathological changes typical of lymphosarcoma. Symmers, who reports on the histology, comments on the types which may occur in mycosis fungoides, and makes three classes: (1) Resembling a granuloma; (2) Diffuse lymphocytic growth; (3) Lymphosarcoma.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1924, Aug., 183; ²*Ibid.* 1925, 3.

PLATE XLI.

MYCOSIS FUNGOIDES

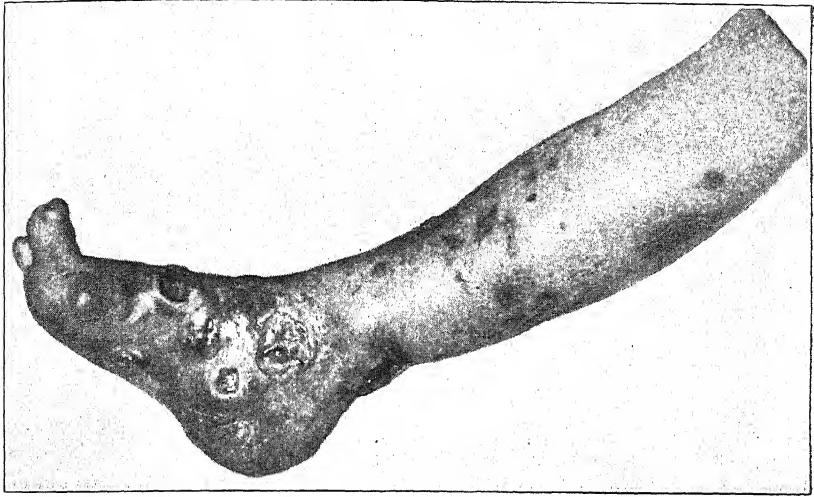


Fig. A

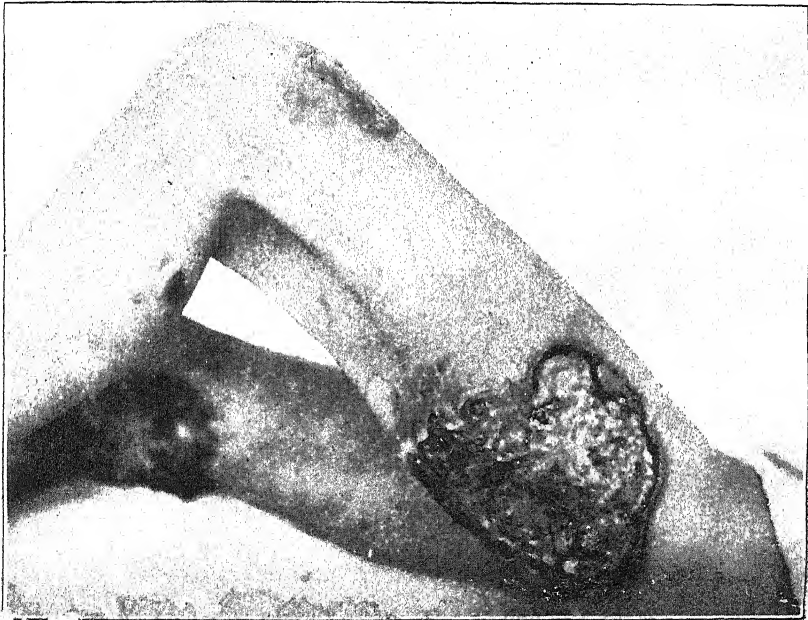


Fig. B

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MYOSITIS OSSIFICANS.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

T. P. Noble¹ gives a record of a group of 18 cases observed in the Mayo Clinic in the last thirteen years. This would indicate that the condition was rarer amongst the patients treated in this clinic than in centres at home. The present reviewer (W. I. de C. W.) has no figures available, but many cases have been treated in Mercer's Hospital, the Blackrock Orthopaedic Hospital, and in private practice from time to time. Most of the cases occurred after dislocation of the elbow, in the brachialis anticus, but a number of cases arose in muscles, such as the quadriceps, after war wounds. Noble points out that in the traumatic type the condition may easily be mistaken for sarcoma. He states that myositis ossificans takes various forms: (1) Progressive; it comes on early in life, is of unknown etiology, and all the muscles of the body are slowly converted into osseous tissue. (2) The circumscribed form known as muscular osteomata, such as 'rider's bone'. (3) Another localized form, the result of a variety of etiological factors, the commonest of which is a simple, severe, closed trauma. (4) In which a complete muscle becomes slowly ossified without any history of injury whatever. The great bulk of the cases are in males, and occur early in adult life when one is most likely to be exposed to injury, although cases are recorded as having occurred as early as five years and as late as sixty-five years of age. When the disease appears in the quadriceps it is generally likely to be mistaken for sarcoma. These two diseases have many points in common, clinically, etiological, and by X-ray; the growth is rapid in both diseases. There are, however, several points of dissimilarity. In myositis ossificans the growth usually ceases after a number of months, and absorption takes place to a certain extent. Myositis ossificans is more likely to occur in the middle of the shaft if in the thigh, or at least away from the epiphysis, and is uniformly hard on palpation. The early stages are accompanied by pain, whereas in sarcoma there is hardly any pain in the early stages. The natural tendency is towards cessation of growth after some weeks, and a variable degree of reabsorption; in fact, in many cases perfect function has been restored.

Noble states there are two facts to remember in treating the traumatic form: (1) Simple excision in the early phases is invariably followed by recurrence; (2) The disability due to interference with locomotion ultimately gives way and perfect restoration of function take place, although months or years may be required. The treatment may be divided into two stages: (a) when the condition is developing—complete rest; (b) when the process has ceased and begun to consolidate—massage and exercise. After the process has been quiescent for six months, if there is functional disability, operative treatment may be indicated.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1924, Dec., 795.

NASAL ACCESSORY SINUSES.*A. J. M. Wright, M.B., F.R.C.S.*

Bronchiectasis Associated with Accessory Sinus Disease.—Attention was drawn to this association in the MEDICAL ANNUAL for 1922, p. 284. James Adam¹ now states that, as far as he knows, this association has not been dealt with in the literature. It would seem, therefore, worth while again referring to the subject and giving his conclusions. He quotes four cases in which a chronic accessory sinus suppuration, chiefly antral, was found in association with chronic bronchiectasis, and he suggests that the former was the cause of the latter. [From his own experience, the reviewer agrees that this association is not a rare one. Adam's deduction, however, that the nasal suppuration is the cause of the bronchial infection, is not so certain. In some cases, at any rate, it seems probable that the infection of the two parts of the respiratory

tract takes place simultaneously, and this is, to some extent, supported by the only too frequent observation that surgical treatment directed to the nasal supuration does not produce improvement in the bronchial trouble.—A. J. M. W.]

Antral Sinusitis from a Dental Standpoint.—The maxillary antrum may frequently be infected by sepsis of dental origin. B. J. Cipes² deals with this type of infection from a dental standpoint, and emphasizes the necessity for careful oral examination, which should include radiograms of the teeth, in all cases of chronic antral sinusitis. He points out the following possible ways in which oral infection may involve the antrum. The antrum may be infected during the extraction of a tooth whose apex enters that cavity. In carrying out a root filling, sepsis may be introduced. During the removal of teeth, they may be actually forced up into the antrum, and the commonest method of all is for sepsis to spread from an infected pulp, sometimes with the preliminary formation of a dental cyst. In addition, occasionally, in an interstitial gingivitis, infection may spread to the antrum without any actual caries of the teeth. R. J. Ivy³ considers the question of damage to sound teeth resulting from surgical operations on the maxillary antrum. This damage may result from either the Caldwell-Luc or Denker operation, and is due either to exposure of the roots of the teeth by removal of the bone covering them, or to interference with their vascular or nerve supply. As a result of the examination of a number of cases at varying periods after such operations, he finds that, while a temporary anæsthesia of the teeth may occur, this is always recovered from during the course of months, and the actual death of a tooth by interference with its root was not observed in any cases.

Postural Treatment of Antral Sinusitis.—The influence of posture in the drainage of suppurations in various parts of the body is of importance, and S. L. Olsho⁴ has elaborated the detail of its use in the treatment of maxillary sinus suppurations. His directions are as follows: Two or three drops of cocaine 2 gr., camphor 1 gr., ol. cinnamon 1 min., liquid paraffin 1 oz., are instilled into the nostril with a dropper to shrink the mucosa. Fifteen minutes later, the patient bends forwards at the hips, with the head hanging almost to the ground, and, while in this position, blows his nose. This manipulation is carried out three or four times daily, and would seem to be a rational one.

Meningitis of Nasal Origin.—Meningitis, as a result of nasal disease, is less common than the variety due to disease of the middle ear, and has therefore received less attention. The following is a summary of a general review of the subject by W. M. Mollison.⁵

Path of Infection.—This may be either by a direct spread through the bone, by a spreading thrombosis in the venous channels, or by the lymphatics, the latter being a fairly frequent path in the cases sometimes seen after aseptic operations on the nose, such as a submucous resection or cauterization of the turbinates. Lymphatics have been demonstrated passing along the fibres of the olfactory nerves to the meninges.

Origin of Meningitis.—Cases group themselves into non-operative cases and those which follow nasal operations. *Non-operative cases:* These generally occur in the course of chronic disease, and are most frequently due to a spread from the frontal sinus. In these cases, some other complication, such as cerebral abscess, is frequently present. *Operative cases:* In the early days of the external frontal sinus operation, meningitis, not very infrequently, was a result. Owing to improved technique, however, this is now rarely seen. The more interesting group of cases is that which occurs after intranasal operations. Although these are infrequent, they are so dramatic as to merit consideration. Almost every variety of intranasal operation has been responsible for meningitis. In some of these cases a fracture of the cribriform plate was responsible,

and in others the leaving of a plug in the nose. The prognosis of cases of post-operative meningitis is extremely bad, only a few cases of recovery having been recorded.

The diagnosis of cases of meningitis resulting from nasal disease does not differ from that of other varieties of infective meningitis, but the disease is usually extremely rapid in its course. From a practical point of view, seeing that a large proportion of the cases follow intranasal operations, it is important to take every precaution to avoid this calamity. These precautions are: to avoid operating in the presence of an acute rhinitis; if possible to open all infected sinuses at one sitting; never to leave a plug in the nose for more than twelve hours; to treat the middle turbinals gently; and, above all, to avoid the olfactory groove with risk of damage to the cribriform plate.

Latent Accessory Sinus Disease.—While the signs and symptoms of manifest suppuration in the accessory sinuses are fairly well defined, the frequency, or otherwise, of so-called 'latent' cases is still in dispute. As a result of his personal observations, J. K. M. Dickie⁶ regards chronic hyperplastic catarrh of the antrum as a not infrequent condition. Diagnosis is difficult in that puncture and washing out of the antrum not infrequently gives a negative result as far as discharge is concerned, and, in addition, the cavity is not darkened on transillumination. He has found, in cases of recurrent nasal polypi, that the antral lining is frequently polypoid, and this cavity should be investigated. In many cases, latent antral suppuration may be present for years without giving rise to any symptoms decided enough to bring the patient to a rhinologist. Some phlegm in the throat and chronic cough may be the only symptoms, and the resemblance between this condition and pulmonary tuberculosis may be striking. Unilateral headache, which may be occipital and is only rarely infra-orbital, is a common symptom. He concludes that a thorough routine examination of all patients with a history of chronic catarrh in any part of the upper respiratory tract, will reveal a surprising number of latent nasal-sinus suppurations.

Nasal Accessory Sinuses and the Eye.—This question was discussed by the Scottish Society of Otolaryngology and the Scottish Ophthalmological Club, but opinion seems still to be somewhat sharply divided as to the frequency with which nasal-sinus disease can be regarded as the cause of defects of vision. The position can best be summarized by giving the essential points in the papers read at the meeting. Logan Turner⁷ stated that the ophthalmologist is unable to give a definite clinical picture of cases of visual disturbances caused by nasal lesions. His difficulties are increased by the fact that improvement in vision may immediately follow the opening of sinuses in cases in which the eye changes are dependent upon an entirely different cause, such as disseminated sclerosis. The laryngologist, also, is not always in a position to say whether, after careful examination of the case sent to him, the nasal sinuses are diseased or healthy. Latterly, attention has been drawn to the existence of 'latent' sinus disease, and, in these cases, subjective nasal symptoms may be entirely absent. The careful observation of a series of cases, some of which have undergone nasal operations and others have not, is required. W. S. Syme⁸ agreed that among rhinologists there are two groups: those who hold, as he does, that infection of the posterior nasal sinuses is frequent, and those who deny it. His general impression is that, in cases of sphenoidal-sinus disease, changes in the optic disc are found in a proportion far beyond what obtains in the same number of people not thus affected. He considers that the opening of the sphenoidal sinus, even if defined clinical signs are absent in the nose, is justified at the request of the ophthalmologist. Gavin Young⁹ also is of the same opinion. H. M. Traquair,¹⁰ from an ophthalmological point

of view, observes that the changes in the eyes, supposed to be associated with nasal sinus disease, vary very much in accordance with the observer. He suggests that changes in the visual fields are found as frequently in normal individuals as in those supposed to be suffering from latent sinusitis. He points out that no case of optic atrophy in which sinus disease previously unrecognized was subsequently found to be present, has been noted in the Edinburgh Clinic. J. S. Fraser¹¹ compares retrobulbar neuritis with nerve deafness and giddiness, which are usually due to a neuritis the result of syphilis, focal infections, arteriosclerosis, nephritis, intestinal auto-intoxication, tobacco, quinine, etc., and not to middle-ear suppuration and mastoiditis. By analogy, one would not expect that the similar condition of retrobulbar neuritis should be commonly due to nasal-sinus suppuration.

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NERVES, PERIPHERAL, SURGERY OF. (See also TENDON TRANSPLANTATION FOR PARALYSIS.)

A. W. Adson, M.D., F.A.C.S.

J. M. T. Finney and W. Hughson,¹ of Baltimore, report the results obtained in 32 cases operated on, either one or more times, for *spasmodic torticollis*. The disease derives its name from a sudden convulsive movement or spasm of one or more groups of muscles that move the head on the body. Other groups of muscles may also become involved in aggravated cases, e.g., those of the shoulder and arm, of deglutition, and even of the chest, trunk, and legs, indicating that the disease is a complex process. Often, when one group of muscles is relieved by operation, another takes up the affection. The full benefit of the operation may not be realized for from six months to three years, although the authors claim more complete cures with less necessity for repeated operation from the procedure herein described than from other methods.

Diagnosis is usually simple, the striking characteristic being the involuntary movement of the head caused by the spasmodic contraction of the muscles of the neck; in the majority of cases it is confined to these muscles. The spasms may vary from a slight nodding to violent contortions, and are either tonic or clonic, or both. The most characteristic position assumed by the patient is extension of the neck, with the head drawn over toward one shoulder, the face rotated to the opposite side, and the chin elevated. There are, of course, many variations from this position. In long-standing cases, facial asymmetry is found, but facial spasm is rare.

Cases have been known to recover spontaneously and after treatment, but medical measures are entirely inconstant and offer no hope in the treatment of this disease. Psychotherapy is too tedious and too uncertain.

In the operative procedure advocated by the authors, the cerebellar position is employed. The incision runs along the posterior border of the sternomastoid muscle, from two finger-breadths below the level of the angle of the jaw, upwards to about the level of the lobe of the ear, curving mesially to a point about two finger-breadths below the occipital protuberance, bilaterally. The flap of skin and subcutaneous tissue is turned back, avoiding injury to the lesser occipital nerve, which is followed down to the proximity of the trunk of the spinal accessory nerve. The spinal accessory is identified by electrical stimulation with a bipolar electrode, after which it is resected without effort to save the sensory branches. The great occipital nerve is then located, subcutaneously, near the mid-line; the trapezius, splenius, and complexus muscles are divided, following the path of the great occipital nerve, down through the two

recti and two oblique muscles to the point where it emerges from the vertebral foramen. Here it anastomoses with the suboccipital nerve. The great occipital is resected below this anastomosis. The suboccipital is then traced back to the main trunk of the first cervical, which is cut. The splenius and complexus muscles are reflected, exposing the third cervical emerging a finger-breadth below the great occipital. The third occipital is then resected, and the wound is closed in the usual way after both sides have been done in the same manner. Of the series of 32 patients operated on, the authors state that 3 are unimproved, 1 has not been heard from recently, 16 have been improved but are not entirely relieved, and 12 have been completely cured. It should be borne in mind that these operations cover a period of more than twenty years, that the earlier operations were very incomplete, and that the operation just described has been developed comparatively recently. They believe that failure to obtain cures is failure to identify and resect the nerve.

The work of Finney and Hughson is particularly noteworthy, since they have been able to cure completely 12 of the series of 32 patients operated on. While one would like to offer a higher percentage of cure to these sufferers, still this procedure does assure the patient of a definite percentage of recovery. Some surgeons prefer to divide the sensory roots of the upper cervical nerves through a laminectomy, but, despite the possibilities of surgical procedures, spasmodic torticollis is a subject that requires much study, since the disease quite frequently exists in a mild degree and in which one would hesitate to advocate so radical a procedure.

Kenneth G. McKenzie,² of Toronto, reports a case of spasmodic torticollis operated on by Cushing. An intrameningeal division of the right spinal accessory nerve together with the combined trunks of the three upper right cervical segments was performed, with much relief. However, when the patient was seen eight months later, the examining physician noticed that "there was complete paralysis and atrophy of the right sternomastoid muscle, weakness and atrophy of the upper trapezius, and slight drooping of the shoulder". With the idea of escaping this weakness and atrophy, the author bases his thought upon the statement by Sherrington, viz., "In decerebrate rigidity the tonic rigidity of a muscle is maintained when all the nerves to the limb have been severed excepting the nerves to the muscle itself. The rigidity of the muscle immediately ceases upon severance of the spinal afferent roots through which pass the afferent fibres from the muscle". From this thought he suggests that intraspinal division of the posterior roots only of the upper cervical nerves be performed, leaving the anterior roots intact, thinking that by this means the spasm of the posterior muscles, as seen in torticollis, could be markedly diminished, if it could not be abolished entirely, and that the weak active functions of these muscles could still be retained.

Cushing, in discussion, recalls a case operated on by A. S. Taylor in which four posterior cervical roots were sectioned, as suggested by McKenzie, with improvement after three months. He also recalls a bilateral case, operated on by himself, in which "the second cervical nerve of the left side was divided intradurally, and also the sensory fibres on the opposite side". There was some relief on the left, but symptoms returned on the right, associated with a good deal of pain. He thought that both Taylor and McKenzie failed to take the spinal accessory sufficiently into consideration, and stated that it is quite probable that a number of these intraspinal procedures may have been thus half-heartedly undertaken in days gone by, and may not have been reported because they resulted in no appreciable benefit.

Thomas F. Mullen,³ of Pocatello, Idaho, reports one case of *plexiform neuroma*, and reviews the literature on the subject. The pathological structure of his

tumour corroborated the interpretation which Verocay placed upon the cytological findings, in that the tumour arose from the cells of the sheath of Schwann and were essentially glial in character.

W. R. and A. R. MacAusland,⁴ of Boston, Mass., in an excellent article on *injuries of the musculospiral nerve*, state that the musculospiral nerve is frequently involved in injuries to the upper extremity, due largely to the close approximation of the nerve to the shaft of the humerus in its middle third. Slight injuries with early recovery are of little consequence, but injuries with paralysis from trauma or secondary scar tissue demand early recognition and treatment. In these cases the wrist drops, and power of extension of the hand is lost. The hand is held pronated and half flexed, with the palmar surface slightly concave. If the hand is placed on a resistant surface, the lateral movements are impossible. If the deformity has existed for some time, there is a marked prominence of the dorsum of the hand, due to the stretching of the dorsal ligaments of the wrist and the subluxation of the carpals. Extension of the fingers at the metacarpophalangeal joints as well as extension of the terminal phalanx of the thumb is lost. The forearm is half-flexed, and no extension is possible at the elbow. Supination is entirely lost when the forearm is extended on the arm, but, if the forearm is flexed, a moderate degree of supination is possible through the action of the biceps. There may or may not be any loss of sensibility. The area of loss when the nerve is divided extends roughly over the dorsum of the hand and lower wrist.

In complete division of the nerve, no pain is experienced. If the nerve is injured or compressed by organized callus or scar tissue, the sensation of pain is most evident a few days after the injury. All the muscles supplied by the musculospiral nerve should be tested for movement, tone, reflexes, and atrophy. If the examiner discerns a slight trace of movement, spontaneous recovery may be expected. Faradic irritability after ten to fourteen days, or a brisk galvanic reaction even though the faradic irritability is absent, shows that the reaction of degeneration is not present, and is an indication to adopt expectant treatment. A feeble galvanic response indicates that the nerve has degenerated.

Complete division is the result of fracture or direct injury. The paralysis occurs suddenly, and in these cases the nerve should be sutured at once. Symptoms of injury from callus or scar-tissue formation come on slowly. Prognosis following operative procedure is very good, with few poor results. The shorter the interval between injury and operation, the better the prognosis, although cases operated three and a half years after fracture have resulted in complete restoration of function. The establishment of continuity by end-to-end suture offers a greater chance of success than any other operative procedures such as grafting, implantation, or transplantation of nerve. Any open wound over the musculospiral nerve, accompanied by wrist-drop, should be enlarged and the nerve examined. If a division of the nerve is present, a suture should be done at once. If the exact condition of the nerve cannot be determined, it is well to wait to see if power returns spontaneously. During this period, however, the fingers and wrist should be held in hyperextension, which position always favours the return of muscle power. If, after three or four months, paralysis still persists, exploratory operation should be performed. Frequently the nerve may be completely divided, constricted, torn, or bulbous at one end, and in such cases the usual procedure is to excise the affected portion, freshen the nerve-ends, and establish continuity by suture. If the nerve is intact, simple freeing of it is very often all that is necessary to relieve the condition.

The authors locate the upper and lower parts of the nerve outside of the field of injury, and dissect up and down to the field of damage. Resection is made by means of a safety-razor blade; the ends are then approximated, and the

entire sheath about the nerve sutured with linen. Where retraction has taken place, it is often necessary to place the arm in flexion to gain approximation. It is rarely necessary to shorten the humerus; this is justifiable only in case of ununited fracture. After suture, the nerve should be placed in a new non-scar tissue bed, usually between fat or muscle. The elbow should be held in flexion for at least five to six weeks, and then gentle passive motions may be started. The wrist and fingers must be held in hyperextension to avoid flexion contraction, to favour muscle regeneration, and to prevent the stretching of the extensors, which in itself is an important factor in hindering the return of muscle power. As soon as motion begins to return, graduated massage and muscle training are of great advantage. The time when improvement begins varies from a week to several months. Motion usually begins to return in three or four months, and it is usually a year before restoration is complete. If, after excision, too large a gap exists between the nerve-ends to give approximation by manual stretching of the nerve, plastic neurotomy, implantation of nerve or nerve-graft, according to the indication and the relative merits of the procedures, may be employed. These failing, or in failure of the end-to-end suture, tendon transplantation is a commendable procedure.

[The above article deserves special commendation because of its practical and detailed presentation. However, the reviewer does not concur in the authors' opinion concerning plastic neurotomy, implantation of nerves, or nerve-grafts, since these procedures, on the whole, prove of very little value. It has been our experience that time is frequently wasted in attempting to force a nerve to regenerate, especially when it is very evident that the gap between the severed ends is too long to permit the same; and tendon transplantation should have been done months before, that is, transplantation of the flexor carpi radialis and of the flexor carpi ulnaris to the extensor of the hand and fingers.—A. W. A.]

Alfred W. Adson,⁵ of the Mayo Clinic, Rochester, in an article on the surgical treatment of *facial paralysis*, reviews the literature, anatomy, and surgical indications, and compares the various surgical techniques. He emphasizes the fact that most facial palsies of inflammatory origin recover spontaneously; however, if there are no signs of recovery in six months, some type of nerve anastomosis is indicated. End-to-end suture of the involved nerve, within the facial canal, is generally conceded to be the ideal nerve anastomosis; however, this is not so easily done, and can be employed only in an occasional case. More frequently the surgeon is compelled to substitute a nerve; on the choice of such substitution there is a division of opinion: some suggest transference of the proximal end of the spinal accessory to the distal end of the facial; others suggest transference of the hypoglossal to the distal end of the facial. There is considerable argument for and against both methods.

It is the author's opinion, after a careful review of the records and observation of a large group of patients operated on, that there is very little difference between faciohypoglossal and spinofacial anastomosis. There are slight advantages and disadvantages incident to each method. The principal factors involved in the anastomosis are: (1) Accurate approximation, with interrupted sutures of silk, between the proximal and the distal ends of the nerves sutured; (2) The time of repair, which should be as soon as possible after the injury.

In the absence of acute inflammation or injury, anastomosis of the descendens noni to the peripheral end of the spinal accessory has been suggested in addition to the spinofacial anastomosis, to prevent atrophy of the trapezius and sternomastoid muscles; and anastomosis of the descendens noni to the peripheral portion of the hypoglossal in addition to the hypoglossal anastomosis, to prevent atrophy of the tongue. Ability to dissociate movements of the face from those

of the shoulder or tongue depends upon the mentality of the patient and his co-operation in carrying out persistently the necessary exercises for dissociation of these movements.

Whether the spinofacial or the faciohypoglossal anastomosis be employed, the degree of improvement depends directly upon the duration of the paralysis, the accuracy of the anastomosis, and the intelligence and co-operation of the patient. When the paralysis has existed for a period of, or more than, three years, little can be expected from a nerve anastomosis, and a plastic operation on the muscle may be considered. Of the numerous plastic operations which have been described, Eden's method of transferring a strip of the masseter muscle from its attachment on the end of the jaw to the angle of the mouth, in addition to transferring a strip of temporal muscle to the outer canthus of the eye, is perhaps the most efficacious. Silver wire has been employed in raising the angle of the mouth, but is not extremely satisfactory.

Alfred W. Adson,⁶ in an article on the surgical treatment of *glossopharyngeal neuralgia*, discusses the symptomatology and presents the histories of four patients operated upon for glossopharyngeal neuralgia at the Mayo Clinic. He states that glossopharyngeal neuralgia is a disease similar to trifacial neuralgia in that the pains associated with it are spasmodic, excruciating, and lancinating, but radiate from the pharynx and tonsillar fossa to the ear. The pain is brought on by swallowing or yawning, and lasts for only a few moments; the intermittent periods of pain and ease may continue for from a few weeks to several months, but always recur. As in trifacial neuralgia, temporary relief is obtained by peripheral avulsion. In all probability the disease involves the superior jugular ganglion of the glossopharyngeal nerve, and while it may be possible occasionally to avulse both the petrosal and the jugular ganglion from an extracranial approach, the only assurance of permanent relief lies in division of the glossopharyngeal nerve proximal to the superior ganglion, through an intracranial approach. The author advocates the cerebellar approach and intracranial division of the glossopharyngeal nerve for the relief of this disease, since the technique is no more formidable than the extracranial avulsion, and should afford permanent relief.

REFERENCES.—¹*Ann. of Surg.* 1925, Jan., 255; ²*Surg. Gynecol. and Obst.* 1924, July 5; ³*Ann. of Surg.* 1925, June, 1093; ⁴*Amer. Jour. Med. Sci.* 1925, Jan., 1; ⁵*Arch. of Otol.* 1925, ii, Sept., 217; ⁶*Arch. of Neurol. and Psychiat.* 1924, xii, 487.

NEURALGIA, TRIGEMINAL: Treatment by Alcohol Injections.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The best and most lasting results from alcohol injections are obtained from injections into the Gasserian Ganglion itself. The reasons why this procedure is not more widely adopted are probably associated with want of confidence in its results, unfamiliarity with its technique, and over-estimation of its drawbacks. The technique of injection into the Gasserian ganglion is an amplification of the original method of Schlösser for injections into the foramen ovale at the base of the skull. Instead, however, of approaching this foramen laterally, close below the zygoma, it is more satisfactory to attack it antero-posteriorly, remembering that it is really a short canal rather than a foramen. If our needle enfilades this canal longitudinally, it will reach the Gasserian ganglion at its upper end. The needle enters the cheek at a point corresponding to the alveolar margin of the second upper molar tooth, or, if that is absent, at a point opposite the upper alveolar margin at a distance 6 cm. downwards and forwards from the articular process of the zygoma, a point which can always be identified. The needle is thrust through the substance of the cheek between upper and lower jaw, care being taken not to perforate the buccal

mucous membrane. It sweeps round in a slightly curved path so that it may clear the pterygoid process, until it reaches the foramen ovale at the base of the skull in its infratemporal plane. When the needle is accurately within the foramen ovale, it lies so that when looked at from the front it points to the pupil of the corresponding eye, and when looked at from the side it intersects the* articular tubercle of the zygoma. The intersection of these two lines corresponds to the lower end of the foramen ovale; this line, if prolonged backwards, intersects the cranial surface behind at a point about two finger-breadths in front and to the opposite side from the apex of the lambdoidal suture.

Having reached the foramen, we have a choice between partial and total injection of the ganglion. If the ganglion can be only partially destroyed by the alcohol, the first division of the nerve may escape, thereby avoiding anaesthesia of the cornea with its accompanying risks of ulceration and serious infection of the eye. Härtel,¹ now of Osaka, in Japan, attains his partial injections by penetrating only a distance of $\frac{1}{2}$ cm. into the foramen ovale and injecting not more than $\frac{1}{2}$ c.c. of alcohol. This produces a transient complete anaesthesia of all three divisions, which partially clears up next day and induces permanent anaesthesia limited to the previously painful areas. Total destruction of the Gasserian ganglion is achieved by pushing the needle deeper along the canal, for 1 to $1\frac{1}{2}$ cm.; then, with the co-operation of the patient, who is only under local anaesthesia, the alcohol is gradually injected in larger amount, up to 1 or even 2 c.c., producing paraesthesia and then anaesthesia of all three territories of the trigeminal. If this is not achieved at the first sitting, or if sensation returns next day, the injection must be repeated until total anaesthesia is attained. Certain technical difficulties may occur owing to anatomical variations, such as a narrow foramen ovale, or abnormal bony projections at its orifice; more often the difficulty is owing to the presence of dense fibrous tissue resulting from previous alcohol injections. Patient, cautious palpation with the point of the needle is required to ensure accurate entry into the foramen, and it is sometimes necessary to suspend operations for a day or two and then make a fresh trial.

As to the results of such injections, if the ganglion be successfully reached, complete relief from pain is the rule. The duration of relief depends on whether the ganglion has been partially or totally destroyed. Härtel records 76 European and 32 Japanese cases: 42 cases of total destruction of the ganglion showed recurrence in only one case; this was reinjected and then remained free. In 9 cases where total anaesthesia was not attained, 7 recurred, at intervals varying between six months and four years, and required fresh injections. A further group, comprising 25 cases, or about one-third of the total, in which partial anaesthesia was deliberately carried out, so as to avoid corneal anaesthesia, recurred, but were relieved by further injections. In a final group of 7 cases, in which the malady was associated with hysteria or with migraine, or where syphilis had not been recognized, the results, as might be expected, were unsatisfactory or only transient.

What are the risks of alcoholic injection of the ganglion? In the first place the mortality is nil, as compared with the 11 per cent mortality of gasserectomy according to Krause's statistics. Care must be taken to avoid injury to the Eustachian tube or to neighbouring blood-vessels, and especially not to induce thrombosis of the veins or cavernous sinus, or to injure the optic nerve, as has occasionally happened to incautious operators. Before injecting alcohol, we must make sure that no blood is escaping through our needle; also that there is the characteristic feeling of resistance when injecting fluid into a bony foramen. Accessory phenomena, such as headache and vomiting, may be

produced from meningeal irritation if the alcohol is injected too rapidly or too deeply. The depth of injection should always be controlled by observing the distance to which the needle penetrates after once engaging in the mouth of the foramen. Ocular palsies are not uncommon, but always clear up. Corneal ulceration is always liable to occur, just as it does after gasserectomy. The patient is therefore carefully instructed how to prevent corneal damage: firstly by wearing a watch-glass over the eye for several months after injection of the ganglion, and secondly by careful daily bathing of the conjunctiva with boric lotion or the application of a boric ointment. Owing to the painlessness of inflammatory reactions in such an eye, a careful look-out must be kept for warning signs, such as injection of the conjunctival vessels or excessive secretion of conjunctival mucus. If either of these appear, the watch-glass must be resumed and atropine and boric instillations commenced at once.

REFERENCE.—*Munch. med. Woch.* 1924, Aug. 8, 1929.

NEWBORN, HÆMORRHAGE IN THE. *Reginald Miller, M.D., F.R.C.P.*

J. N. Cruickshank¹ divides cases of hæmorrhage in the newborn into two groups: (1) The true birth hæmorrhage, due either to white asphyxia or to injury; and (2) Spontaneous or idiopathic hæmorrhage, in which the coagulation time and the bleeding time are both definitely prolonged. The latter may be due to sepsis, congenital syphilis, or possibly to hæmophilia, but in many instances the cause is so obscure as to justify the term idiopathic hæmorrhage. The bleeding in this class of case may occur anywhere, but the chief loss of blood is from the gastro-intestinal tract, and the amount lost is so great as to reduce the child to a state of extreme anæmia which is soon fatal if the bleeding be not checked.

TREATMENT.—In the treatment of spontaneous (idiopathic) hæmorrhage of the newborn, Cruickshank regards the subcutaneous or intravenous injection of **Whole Blood** as practically specific, and far superior to the use of serum. The author gives careful directions for the method as follows:—

In all cases where it is suspected that the 'hæmorrhagic diathesis' exists, the coagulation time and the bleeding time should be estimated.

To test the *coagulation time* all that is required is a sharp Hagedorn needle, a pair of watch-glasses, and a small lead shot. These should be carefully cleaned with soap and water followed by ether. A drop of blood is allowed to fall from a needle puncture in the heel into one watch-glass containing the shot, and the second watch-glass is inserted over it to prevent evaporation. Every half-minute the glasses are tilted so as to allow the shot to roll. The point at which it ceases to do so is taken to indicate the time of coagulation. Tested by this method the normal coagulation time in the newborn ranges between five and ten minutes. In cases of hæmorrhagic disease the period may be prolonged to half an hour or more.

In the normal child the *bleeding time* ranges between two and five minutes. It is tested simply by pricking the skin of the heel and removing the drops of blood with filter paper as they appear. If they continue to do so for more than five minutes there is an increase in the bleeding time. In many cases of hæmorrhagic disease the puncture goes on oozing for hours or even days.

As soon as the diagnosis is confirmed in this way, preparations should be made for the injection of blood.

Subcutaneous Injection.—The simplest method of doing this is with an ordinary serum syringe of about 20-c.c. capacity. The syringe is sterilized and fitted with a fairly wide-bore needle such as is ordinarily used for intravenous therapy. The arm of the donor is constricted with a tourniquet, the skin is cleansed, and the needle of the syringe inserted in a vein. From 10

to 20 c.c. of blood are taken into the syringe, and the instrument is withdrawn after removal of the tourniquet. Without delay the needle is inserted through the sterilized skin of the infant in the mid-scapular line. The needle should point outwards towards the axilla. The blood is then injected deeply into the subcutaneous tissues. When the needle is withdrawn, the puncture is sealed with collodion and the surrounding area is gently massaged for a minute or two. The results of this treatment—provided it is applied early enough—are very satisfactory, and the ease with which the operation can be performed makes it a method of real use to the practitioner.

Intravenous Transfusion.—It is claimed that even better results are obtained, however, by the intravenous transfusion of blood. For this purpose either a large serum syringe or one of the more elaborate forms of transfusion apparatus may be employed. If a syringe is used it should be one of 20 c.c. capacity, and should contain 2 c.c. of a 10 per cent solution of sodium citrate. A cannula with a short rubber tube attached is inserted into the donor's vein and clamped. A similar tube and clamp are attached to the needle inserted into the infant's vein, so that as many syringefuls of citrated blood may be given as the child may be thought to require. A severely exsanguinated infant can take as much as 15 c.c. of blood per pound of body-weight (L. B. Robertson). With regard to the route chosen for intravenous injection in the newborn infant, it may be noted that the superior longitudinal sinus is the most satisfactory one. For anyone who is in the habit of performing venipuncture it is a simple matter to enter this sinus through the anterior fontanelle. The child, wrapped firmly in a blanket, is placed on a table on its back, the needle is held at an angle of about 25° with the skin, and is inserted at the occipital angle of the fontanelle with its butt towards the frontal region. Another method is to use one of the veins of the scalp which are so prominent in young infants. Unfortunately they are less easily punctured when the child is exsanguinated. If this route is chosen the child is held firmly on the side with its head resting on a sand-bag or hard pillow. Pressure with the thumb on the temporal region will bring the veins into prominence, and the needle can be inserted almost parallel to the skin with its butt pointing towards the crown of the head. The arm veins are not suitable for intravenous injection in the infant, but the internal saphenous vein and even the external jugular vein have been used with success.

Precautions in Selecting a Donor.—A word may be said with regard to the choice of a donor. Ideally the blood of the donor should be tested to ensure that the Wassermann reaction is negative, and the blood of both the donor and of the infant should be 'grouped'. If there is no opportunity for testing the compatibility of the donor's blood, the safest procedure appears to be the injection of the mother's blood subcutaneously, as described above. A very simple method of carrying out the compatibility test is, however, available. A few drops of the infant's blood are allowed to clot in a capillary tube or Wright's capsule. The serum is then separated from it by swinging in a centrifuge. A large drop of the serum is transferred to a slide by means of a capillary pipette wet with citrate solution. To it is added a small drop of the donor's blood and a cover-slip is put on. If no agglutination of the corpuscles is seen under the microscope at the end of five minutes the bloods may be regarded as practically certain to be compatible.

In addition to the specific treatment described, every care must be taken to conserve the infant's strength by warmth and feeding. If possible, a quantity of fluid (either water or normal saline) should be given by the mouth. This is readily absorbed, and helps to restore the blood volume.

Footes³ recommends the Injection of Blood under the skin or intraperitoneally

in cases of intracranial hæmorrhage in the newborn. He states that used 'prophylactically' in cases of very rapid or difficult labour it is often of greatest benefit to the infant. **Horse Serum**, to be of value, should be very fresh. **Thromboplastin** (10 c.c. subcutaneously) is useful.

REFERENCES.—¹*Lancet*, 1924, ii, 818; ²*Jour. Amer. Med. Assoc.* 1924, Aug. 9, 472.

NOSE, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Atrophic Rhinitis.—A simple method of treating these troublesome cases is suggested by R. von Scheven¹ and should be worthy of trial. At least 20 injections in each case of 2.5 c.c. of 10 per cent sterilized **Salt Solution** are made under the turbinal mucosa, at the rate of three a week. Any nasal douching is avoided during the treatment. Some degree of headache is the only drawback.

Vasomotor Rhinitis.—Cases of attacks of sneezing with watery discharge, which may be included under the above somewhat unsatisfactory designation, are frequent and troublesome. Since the etiological factors are as various as in cases of asthma, the remedies must also be varied to suit individual cases. Patients with a moist, flushed skin, more or less tachycardia, palpitation, and nervousness, are regarded by L. Hubert² as belonging to the hyperthyroid group; while those with a dry skin, slow pulse, and mental dullness he regards as suffering from hypothyroidism. He treats hypothyroid cases with $\frac{1}{16}$ gr. of **Thyroid Extract** thrice daily, while hyperthyroidism is treated with **Quinine Hydrobromate**, 3 to 5 gr. in cachets, twice or thrice daily. He has found that quinine hydrobromate is also useful in rhinorrhœa due to emotional causes.

K. Menzel,³ of Vienna, has also found good results from the use of **Thyroid** and **Ovarian Extracts**, but for cases in which such simpler methods as these fail, he advises the submucous injection of 50 per cent **Alcohol** into the inferior and middle turbinals and the septum. The injections are carried out under cocaine anæsthesia.

Intranasal Adhesions.—Adhesions between the turbinals and septum, as a result of injury or operation, are frequent, and troublesome to treat. Various substances have been advised for the separation of the parts during healing after division of such adhesions. Spalaikovitsh⁴ strongly advocates the use of **Mica**, as first suggested by Moure. It has the advantage of being able to be used in very thin layers, thus not impeding the flow of secretion. It is non-irritating, and can be sterilized by heat. He has devised a standard shape into which the piece of mica can be cut; this is in the shape of a kidney bean cut from a rectangle roughly 2 in. by 1 in. It is inserted with its concavity downwards, and will remain in position without an attached thread. It can be left in position as long as necessary.

Local Anæsthetics.—The difficulty in previous cocaine substitutes is that they are largely inactive unless injected subcutaneously. **Psikain**, a new substitute for cocaine, has recently been introduced, with the claim that it can be used for surface application in the nose and throat. E. Watson-Williams⁵ reports that 7 per cent psikain gives the same anæsthesia in the nose as 5 per cent solution of cocaine. Its toxicity, however, is probably not much less, but it may not have the same tendency to produce addiction. K. Beringer and K. Wilmanns⁶ found, as a result of experimental injections, that psikain does not produce the psychological effects associated with cocaine. K. Brodt and W. Kümmler⁷ also state that psikain is satisfactory both from the point of view of the lower toxicity and the degree of surface anæsthesia produced.

REFERENCES.—¹*Munch. med. Woch.* 1923, Sept. 28; ²*Ann. of Otol. Rhinol. and Laryngol.* 1924, Sept., xxxiii, No. 3; ³*Zeits. f. Hals-, Nasen- und Ohrenheilkunde*, 1924, viii, Heft 2, Feb., 150; ⁴*Rev. de Laryngol. d'Otol. et de Rhinol.* 1925, Feb. 15; ⁵*Brit. Med. Jour.* 1925, i, 11; ⁶*Munch. med. Woch.* 1924, June 27, 852; ⁷*Ibid.* 851.

NYSTAGMUS, MINERS'. (See EYE AFFECTIONS, GENERAL.)

OBESITY.

Ivor J. Davies, M.D.

S. Strouse, of Chicago, and M. Dye, of East Lansing, Mich.,¹ record the results of their studies on the *metabolism of obesity*, and in particular the relation between food intake and body weight in some obese persons. They draw a distinction between obesity and over-weight. "Over-weight usually results from over-feeding, sedentary habits, or a combination of both. Certain cases of obesity unquestionably follow the same causes, but just as unquestionably other cases of obesity are seen which show neither excessive food intake nor lessened energy expense." They conclude "that obesity can and does occur in persons without showing any direct relation to food intake. Our own experience has led us to believe that underweight in otherwise healthy persons also occurs even when the caloric intake is more than sufficient to supply energy demands. Speaking metabolically, the 'constitutional' obese and the healthy under-weight may represent extremes of the same problem".

The same observers² publish the result of their studies on *basal metabolism in relation to obesity*, with the following conclusions: "Sixty-one observations on basal metabolism were made on persons of different weight and build. These observations include eleven on 6 normal, seventeen on 9 under-weight, and thirty-three on 17 over-weight subjects. From this study it can be stated that neither excessive under-weight nor excessive over-weight is associated with a constant change in basal metabolism. We therefore conclude with the statement that obesity cannot be caused by changes in the basal metabolism".

C. C. Wang and S. Strouse,³ of Chicago, record their studies on the *metabolism of obesity in relation to the specific dynamic action of food*, with the following summary: Twenty-six tests were made on 12 obese subjects, using protein, carbohydrate, and fat meals; eleven tests on 5 thin people, and twelve tests on 5 normal subjects. Protein showed a very slight specific dynamic action in obese people. Thin people, on the contrary, showed a very high specific dynamic action of protein. Normal subjects followed much the same course as the thin people, but to a less degree. Normal subjects had the most marked specific dynamic action of carbohydrate. Although obese persons did not react in a uniform manner to carbohydrate intake, the average for the group indicated a lessened specific dynamic action of carbohydrate. The reaction in the three groups did not show so great a degree of difference as occurred after the protein meal. There was very little, if any, evidence of specific dynamic action of fat.

TREATMENT.—E. E. Cornwall,⁴ of New York, makes a contribution to the *Dietetic Treatment of obesity*. He states:—

"While reduction of the fuel value of the diet is essential in the treatment of obesity, indications for regulating the diet in other respects are frequently present. Obesity is often found, not as a simple and isolated entity, but complicated by or associated with other morbid conditions. It has close relationships with disorders of protein and carbohydrate metabolism. Gout and gravel occur relatively often in the obese, and diabetes mellitus develops so frequently in the obese that the prevention of obesity is considered an important prophylactic measure against diabetes. The obese are favourable subjects for chronic nephritis, chronic arthritis, and arteriosclerosis. Myocardial disease is a common complication of obesity. In the cases developing in middle and later life, which constitute the majority of the cases, regulation of the diet otherwise than by reduction of its fuel value is usually required.

"The young and the very old should not, as a rule, be subjected to

reduction treatment, before the age of twenty practically never, except by the correction of wrong diet, and after fifty with caution, being guided by the condition of the patient. Those entering on old age who have been obese for a long time should not be reduced, and great caution should be exercised in reducing those who have serious diseases, if it is done at all. In any case showing symptoms of distress, the rigidity of the diet should be relaxed or a return made to the normal diet. The reduction should not be carried to an extreme degree. A general rule which the author favours is not to produce a reduction of more than 25 lb. in the first course of treatment. In obesity complicated with heart disease it is desirable to reduce the weight before there is loss of compensation. When there is œdema with obesity and heart disease, reduction should not be undertaken.

"Exercise makes for better circulation and elimination and deeper breathing. But limitations are imposed on the obese in the matter of exercise, both by the obesity itself and by complications. In cases complicated by heart disease, rest may be required in greater or less amount, and the exercise allowed may require to be very strictly regulated. If the obese patient's habit of life is one of moderate activity, it is usually well to have it continue so. Advantage may be gained by letting the patient know that the treatment of his obesity calls for no change in his ordinary ways of life, but only in his diet."

In concluding, Cornwall emphasizes the following points: (1) Obesity is a common disease whose prevention and cure or amelioration mean much for the life and happiness of many; and its treatment in suitable cases by dietetic regulation is safe and generally effective at the hands of trained physicians; but dangers may attend its treatment by unskilled persons. (2) The rate of the reduction in weight should be slow, as a rule not exceeding the average of 2 lb. weekly; and the fuel value of the daily diet should be not less, as a rule, than 1200 calories, and usually more than that. (3) The contra-indications to reduction should be kept in mind, and reduction should never be pushed in the presence of untoward symptoms. (4) It is not enough, in most cases, to diminish the fuel value of the diet; the diet should also be regulated in other ways suitable to complicating and associated morbid conditions.

REFERENCES.—¹*Arch. of Internal Med.* 1924, Sept., 267; ²*Ibid.* 275; ³*Ibid.* Oct., 573; ⁴*Med. Jour. and Record*, 1924, Aug. 6, 124.

OBESITY IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

F. S. Langmead and E. G. B. Calvert¹ publish the results of investigation and treatment in 8 cases of obesity in children. They point out the difficulty in being certain in such cases of any endocrine abnormality, and are of opinion that, before such a conclusion can be reached, obesity should be accompanied by disordered physical or mental growth, whether in the direction of retardation or the reverse. Thus, defining the endogenous from the exogenous cases of obesity, it still is a matter of difficulty to be sure in what gland the endocrine balance is primarily upset. In attempting to inculcate the pituitary there is seldom evidence directly pointing to tumour, such as bitemporal hemianopia, which was absent in all 8 cases. Failing this, evidence may be sought in changes in the pituitary fossa as found by skiagram and increased tolerance for carbohydrates. In 2 of the authors' cases radiological changes were found, and the carbohydrate tolerance in all the cases was carefully tested. The blood-sugar curves were found to be diverse in the outlines; in 2 cases normal curves resulted with the use of posterior pituitary substance, and in a third case by the administration of anterior pituitary substance. In the same three cases the use of whole-pituitary substance was not so successful.

For reducing weight they advise a somewhat restricted Diet, in which the

protein is relatively increased, the carbohydrate curtailed, and the fat practically eliminated. The use of Pituitary in such quantities as restored the blood-sugar curve to normal, appeared of considerable value in improving the patient's general condition: it seems to act when given by mouth. Thyroid will lead to a loss of weight, but can hardly be regarded as an ideal remedy, as it does not restore carbohydrate metabolism to normal.

One experiment of particular interest must be mentioned. An extract of bulls' testes was made by the alcohol-fractional-precipitation method devised for the preparation of insulin, and this was administered over a long period to a male patient with obesity, age 11½, who showed infantile sexual organs and an enlarged pituitary fossa. The result on the obesity was remarkable, 2½ stones being lost in three months, although the child was on a full mixed diet. Two control cases on the same diet gained half a stone each in the same period. No change in the patient's sexual organs appeared during the treatment.

B. S. Veeder² publishes an interesting study of what he terms 'the overweight child'. His criterion is roughly that the child should be some 20 per cent over the average weight for height. He divides them into two groups, the non-endocrine and the endocrine variety. In the former group he has found a very definite inherited tendency towards obesity which is absent in the endocrine group. How this inheritance plays its part is not clear; whether it is over-feeding in the family or some metabolic tendency cannot yet be determined. The few studies of basal metabolism which have been made in such children show no lowering of the normal rate in the absence of endocrine disturbance. To reduce weight is not an easy problem, but is more difficult in the endocrine group than in the other.

REFERENCES.—¹*Lancet*, 1924, ii, 1111; ²*Jour. Amer. Med. Assoc.* 1924, Aug. 16, 486.

OESOPHAGUS, CARCINOMA OF.

A. J. M. Wright, M.B., F.R.C.S.

In the Semon Lecture, Jean Guisez¹ gives the results of his extensive experience. He notes that oesophageal carcinoma is present in rather more than half the cases of oesophageal disease. Men are affected more frequently than women in the proportion of six to one, the average age exceeding 55 years, but one case being observed at the age of 14 years. As to site, the growth was observed in almost equal proportions in the upper, middle, and lower thirds, with a slight preponderance in favour of the middle. In regard to etiology, chronic oesophagitis seems to be the exciting cause, this inflammatory condition resulting from such irritants as alcohol, spiced foods, tobacco, etc. Occasionally a cicatricial stenosis is the primary cause. In addition, cases of old-standing spasm, probably owing to the development of a chronic oesophagitis, not infrequently develop carcinoma. In regard to symptoms, difficulty in swallowing is the essential one and is characteristically painless. The onset of the difficulty is not infrequently sudden. The emaciation and cachexia are solely due to the difficulty in taking nourishment, and are absent until obstruction arises.

Cases can be grouped into clinical types: (1) *Latent Forms*: The condition is discovered accidentally as a result of severe hæmorrhage or emaciation. (2) *Rapid Form in Young Subjects*: The rapidity of growth, as compared with the relatively slow growth in the aged, is striking. (3) *Inflammatory Forms which are Consecutive to an Inflammatory Stenosis of the Mouth of the Oesophagus and Cardia*: In these, the long duration of the dysphagia is liable to lead to the overlooking of the carcinoma when it arises. (4) *Sarcomatous Type*: These cases are rare, and in them, unlike the carcinomatous, pain appears early and precedes the dysphagia.

On examination with the œsophagoscope, the growth is of one of the following three types: polypoid and projecting, ulcerating, or infiltrating. In the polypoid projecting type, the lumen of the gullet is obstructed by an exuberant offensive mass which bleeds on touching. The ulcerating type shows a crateriform ulcer, with projecting edges, which readily bleeds. In the infiltrating type, a hard fibrous stricture is present, covered with more or less normal mucous membrane.

TREATMENT.—This may be curative or merely palliative. Attempts at radical surgical removal have, up to the present, been so unsuccessful that they must be regarded as purely experimental. The use of Radium has, however, given better results; 270 cases have been treated for a period of 15 years, and, in all of these, the diagnosis was established by œsophagoscopy and the microscopical examination of a fragment. In the majority of cases, treatment has prolonged life for from 3 to 16 months; in 30 of the cases, life lasted more than 18 months; and in several cases the growth disappeared under radium treatment and showed no recurrence, in 2 for 10 and 12 years, in 1 for 5 years, in 4 for 4 years, and in 12 for more than 1½ years. The retrogression and disappearance of the tumour has been observed with the œsophagoscope (*Plate XLII*). The radium applications are made by first carefully measuring the distance of the growth from the teeth with the œsophagoscope, the lumen of the stricture being dilated if necessary to take the radium, and the latter is then introduced to the previously measured distance in a container on the end of a bougie.

Palliative Treatment.—Guisez advises intubation in preference to gastrostomy, and has devised a self-retaining rubber tube. It can remain in position for several months (*Fig. 37*).

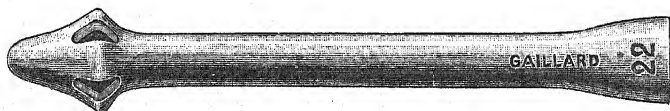


Fig. 37.—Guisez's self-retaining rubber tube for use in cancer of the œsophagus. (Kindly lent by the 'Journal of Laryngology and Otology'.)

W. Hill² gives his results with the use of radium in 77 cases of malignant stricture of the œsophagus. The number of applications varied from one to eight, two-thirds of the cases having had more than one application. His results show that in about one-third of the cases there was remarkable improvement, in another third there was substantial improvement, and in the remainder the improvement was either very slight or absent or the patient was made definitely worse. In three cases the patient died apparently as a result of the application. He also has noted total but temporary disappearance of the growth as a result of the treatment. He concludes that radium therapy in malignant stricture of the gullet, in spite of its uncertainty and the slight element of danger connected with its use, has stood the test of time and has been of proved value in a proportion of well-selected cases.

REFERENCES.—¹*Jour. of Laryngol. and Otol.* 1925, xl, No. 4, April, 213; ²*Ibid.* 1925, xl, No. 2, Feb., 73.

ESOPHAGUS, NON-OPAQUE FOREIGN BODIES IN.

A. J. M. Wright, M.B., F.R.C.S.

The presence or situation of non-opaque foreign bodies in the œsophagus can sometimes be ascertained by an X-ray examination after the swallowing of barium porridge or a bismuth capsule. W. F. Wilson¹ has devised a method

PLATE XLII.

RADIUM IN CANCER OF THE ŒSOPHAGUS

(JEAN GUISEZ)

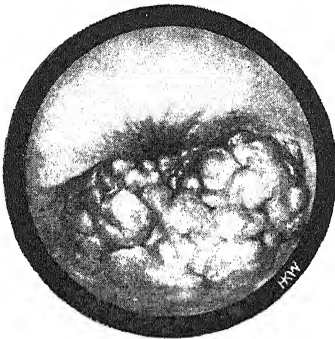


Fig. A.

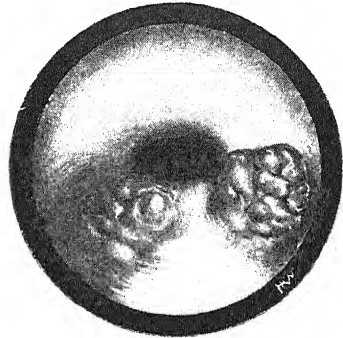


Fig. B.

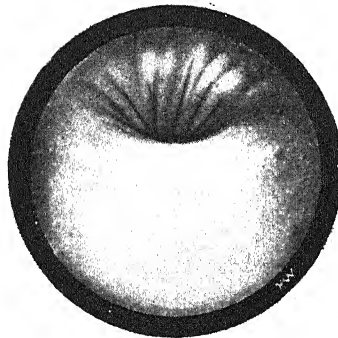


Fig. C.

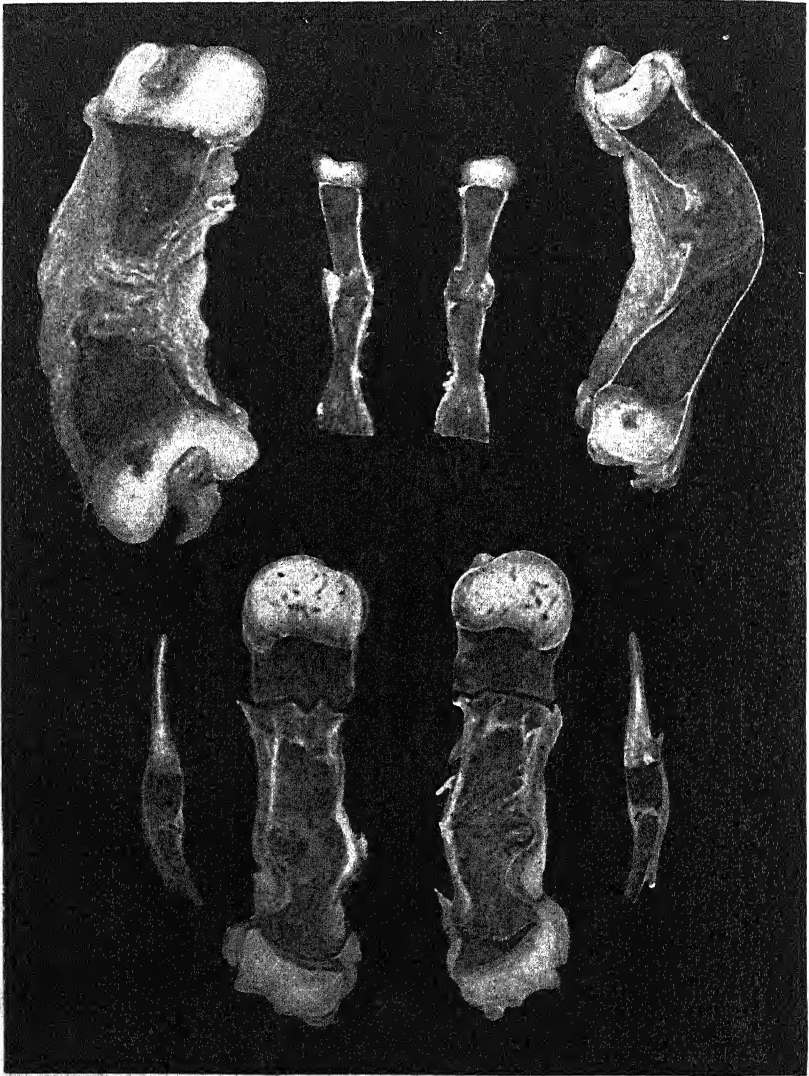
Showing the tumour and the result obtained by radium.

By kind permission of the 'Journal of Laryngology and Otology'

PLATE XLIII.

OSTEOGENESIS IMPERFECTA

(GEOFFREY HADFIELD)



Sections of the femur, tibia, humerus, radius, and rib of a child who died at the age of 9 months, showing fractures in various stages of union. ($\times 1$)

which would seem to be much more effective, and consists essentially in the swallowing of **Cotton-wool Impregnated with Barium**. This becomes entangled in the foreign body. The detail of the method is as follows: Small pieces of cotton-wool are lightly teased out to the size of a shilling or slightly larger, and soaked in barium porridge; these are given to the patient to swallow one at a time to the number of six to eight pieces. A minute or so afterwards, a teaspoonful or more of barium porridge is swallowed. Two or three minutes are then allowed to elapse to give any surplus barium time to leave the gullet. This, of course, should be carried out in the X-ray room. The gullet is radiographed, and the foreign body can then be removed through the œsophagoscope with its enveloping cotton-wool.

REFERENCE.—*Brit. Med. Jour.* 1925, i, 656.

OSTEO-ARTHRITIS. (See JOINT SURGERY, RECONSTRUCTIVE.)

OSTEOGENESIS IMPERFECTA.

Geoffrey Hadfield, M.D.

Plate XLIII shows specimens from a case of this affection which occurred in a child, age one month, who had many partially united intra-uterine fractures of the ribs and long bones and a large defect in the skull at birth, and sustained several other fractures from trivial causes during its short life. Its sclerotics were grey-blue.

The disease appears to be due to a congenital defect in the evolution of the osteoblast (Lawford Knaggs¹). It may be foetal, occur in childhood or adolescence, in children born healthy, or arise in middle or late life. Foetal cases are usually still-born, with large numbers of fractures of the ribs and long bones, some of which are united in utero. There is incomplete ossification of the skull—the cranial vault may be little more than a membranous bag. Some of these cases survive birth: their fragile bones break almost at a touch. In the disease of childhood and adolescence (osteogenesis imperfecta tarda) children born healthy develop fractures from trivial causes, varying in number from under 10 to over 100. The liability lessens as the child matures. There is a strong familial tendency. Many cases have grey-blue sclerotics due to partial visibility of the choroid through the sclerotic; a few have otosclerosis.

In all varieties the fractures are subperiosteal, and thus not very painful; they heal quickly with abundant callus. The chief abnormalities in ossification are: (1) An almost complete absence of rows of osteoblasts at the lines of ossification; and (2) The periosteum produces cartilage-cells instead of osteoblasts. The epiphysal junctions are straight, regular, and sharply defined. The zone of provisional calcification is complete and well marked. The compact bone of the shaft is thin, porous, reticular, and very brittle; the trabeculae are slender and delicate, and widely separated by spaces filled with marrow rich in cells and devoid of fat; many trabeculae lie isolated in this cellular marrow. The proliferative processes in cartilage are normal, and the bones thus grow in length. Bone developed in membrane is equally affected with that developed in cartilage.

REFERENCE.—*Brit. Jour. Surg.* 1924, xi, 737.

OSTEOMALACIA.

Ivor J. Davies, M.D.

Wampler¹ in China reports a survey of osteomalacia. He states that as many as 75 per cent of the patients had tetany; 28 per cent had a positive Chvostek sign; in 31 per cent the disease began during pregnancy, in 30 per cent during the nursing period; in 29 per cent the teeth were painful and Out of a total of 130 children born to osteomalacic mothers, only 54

are living. Osteomalacia resembles rickets in that it attacks people living in poor hygienic surroundings, lacking sunshine. The best results have been with Cod-liver Oil and Calcium. The doses given are $\frac{1}{2}$ oz. cod-liver oil with 15 gr. calcium phosphate morning and evening. The tetany disappears in a few days.

REFERENCE.—*China Med. Jour.* 1924, May, 341 (abstr. in *Jour. Amer. Med. Assoc.* 1924, Aug. 16, 563).

OTITIS MEDIA. (See EAR, DISEASES OF.)

OVARIAN THERAPY.

W. E. Fothergill, M.D.

Emil Novak¹ makes the following sensible and much-called-for remarks on this subject: It may again be emphasized that, rational as ovarian therapy appears to be in some conditions, the results are rarely striking and often nil to the level-headed observer. It cannot be assumed that a commercial extract can replace the normal ovarian secretion in the patient's body, or, for that matter, that it originally contains any of the active hormones of the ovary. There can be little question as to the future importance of ovarian therapy— as regards its present importance there is considerable room for discussion.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1924, Dec. 20, 2016.

PAINFUL FEET. (See FEET, PAINFUL.)

PANCREAS, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

G. Eggers¹ presents a review of six cases of acute pancreatitis which offer interesting evidence as to the etiology of this disease. All the cases were of such a type that it appears exceedingly doubtful that infection could have played any rôle. The onset was very sudden in each. Overwhelming pain was present for a considerable time before there were any fever or any of the usual signs of infection. Neither did the operations or necropsies reveal any evidences of infection. Each appeared to be simply a sudden necrosis of all or part of the pancreatic tissues from some vascular or chemical insult, the so-called pancreatic apoplexy. Cultures were negative in all the early cases. Secondary infection from *B. coli* appears only in the late stages. All six cases gave histories of previous attacks resembling gall-bladder disease, and all showed marked pathological changes in the gall-bladders, five having stones. "Just what the relationship was, whether bile actually entered the pancreatic duct, or whether a gall-stone or spasm of the sphincter temporarily obstructed it and caused increased pressure, with subsequent rupture of the pancreatic duct, it is impossible to state positively." One case which died early without operation is especially illuminating. At autopsy there was found a strip of necrotic tissue running the entire length of the pancreas. The rest was normal except for a few isolated areas of necrosis. Sections showed that this strip was an area about the main duct throughout its whole length. The conclusion is unescapable, in this case, at least, that the attack was due to some offending agent suddenly introduced into this duct. No lymphatic origin can be considered in such a picture.

E. Streissler² describes a *posterior approach to the pancreas* which is indicated in a considerable percentage of cases. The tail especially can be reached by this route with the greatest ease, and drainage made without soiling the peritoneum. The abscesses which occur as sequelæ to attacks of acute pancreatitis are being diagnosed with increasing frequency, and they usually appear in the tail or body. Those cases in which the head undergoes necrosis seldom

PLATE XLIV.

CONGENITAL PANCREATIC DISEASE WITH INFANTILISM
(CREGL, TAIKKE AND GEORGEY HADFIELD.)

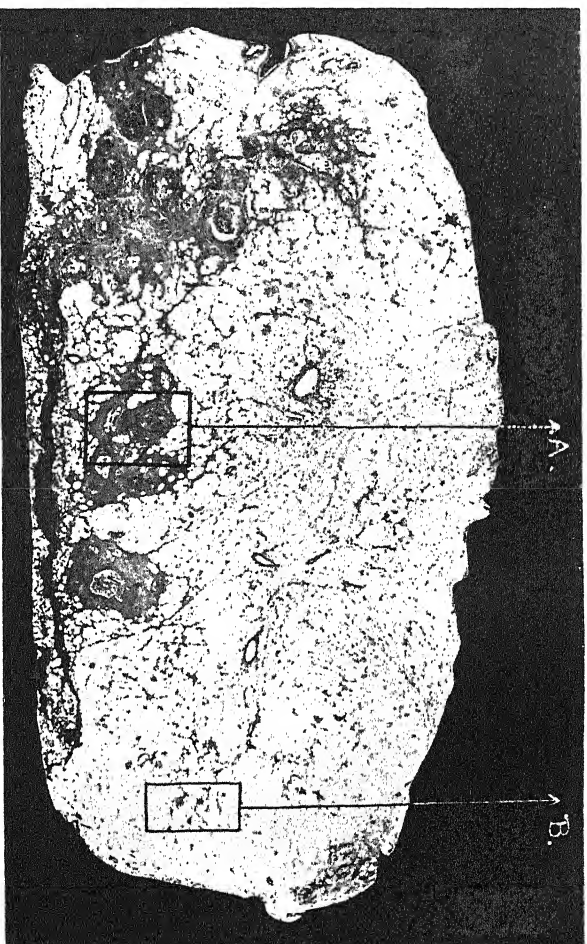


Fig. A.—Photograph of a complete transverse section of the pancreas at the junction of the head with the body of the gland ($\times 9$). The wide expanse of fat is seen in which lies the strand of surviving pancreatic tissue. The gland tissue included in the rectangle A is seen under higher magnification in the original paper; the structure of the fatty tissue included in the rectangle B, in *Figs. B* and *C*.

PLATE XLV.

CONGENITAL PANCREATIC DISEASE WITH INFANTILISM—continued

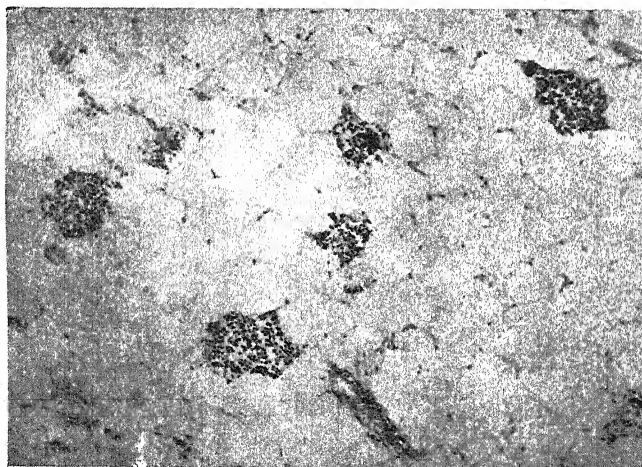


Fig. B.—Photograph of area included in the rectangle B in *Fig. A*. Low-power view of fat containing several masses of islet-tissue.

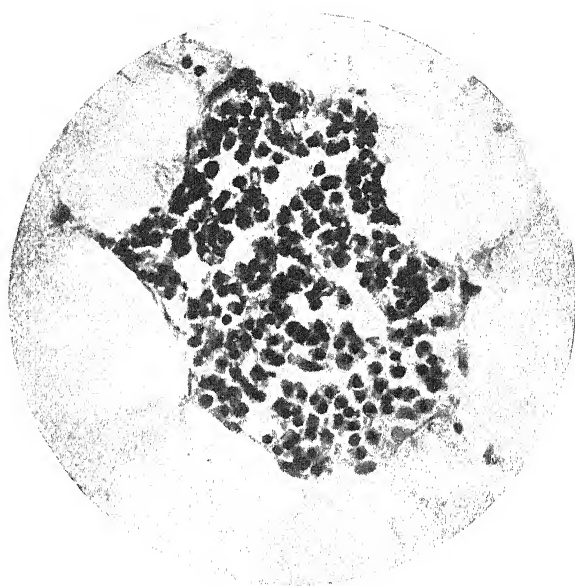


Fig. C.—High-power view of one of these cell-islets. *Fig. C* show the appearance of the islet-tissue lying free in the fat which surrounds the gland-remnant.

live long. Approach to this region is gained through an incision similar to that used for nephrectomy. It extends from the border of the erector spinæ mass to the posterior axillary line parallel to and just below the twelfth rib. The cut extends down through the latissimus and the insertions of the abdominal muscles, and opens into the perirenal fatty space. The lower pole of the kidney is pulled laterally, exposing the ureter and spermatic vessels. These also are retracted laterally, and in the space between them and the iliopsoas an incision is made in the fascia retroduodenopancreatica. This is a very strong layer of fibres in this region, and must be cut with the knife. It is the posterior portion of the general fascial envelope of the belly. Incision through this layer brings us right on to the pancreas. In cases of abscess in the tail, bulging can be noted before any incision is made.

REFERENCES.—¹*Ann. of Surg.* 1924, Aug., 193; ²*Arch. f. klin. Chir.* 1924, Sept. 23, 327.

PANCREATIC DISEASE, CONGENITAL, WITH INFANTILISM.

Reginald Miller, M.D., F.R.C.P.

Cecil Clarke and Geoffrey Hadfield¹ publish what is at present an unique case of a child who died from diphtheria at the age of 4 years, who had from birth passed large fatty stools of the pancreatic type. For the first year she thrived, during the second year she put on very little weight and grew slowly, and by the time she was four years old she was considerably under the normal in height and weight. Post mortem there were discovered profound atrophy of the pancreas, sparing the islets (*Plates XLIV, XLV*), with gross fatty changes in the liver, and thickening and ulceration of the colon.

Our knowledge of pancreatic cases in children is very limited. Setting aside one or two incompletely investigated instances, we know of two groups: (1) Congenital steatorrhœa, in which throughout life fatty stools of the pancreatic type are passed, but in which it is almost certain there is no true pancreatic disease. This disorder is regarded as associated with congenital and lifelong absence of pancreatic lipase, an 'inborn metabolic error'. In this type growth is not particularly affected. (2) Pancreatic fibrosis secondary to chronic colitis of the dysenteric type. In this group stunting and early death occur. Cœliac disease does not owe its fat-wastage to pancreatic deficiency; the fecal fat here is invariably well 'split', and the typical pancreatic stool with the fat separating out as oil-globules or grease is not seen. Bramwell's 'pancreatic infantilism' requires mention, but there is small doubt that his cases were instances of cœliac disease. He claimed them as pancreatic on the ground that some of them showed improvement when treated by pancreatic preparations. It may be well to state that, however much trypsin they may contain, none of the pancreatic preparations on the market at present contain a satisfactory amount of lipase.

From this brief résumé of the present state of our knowledge it will be seen how difficult it is to 'place' the case under review. The authors regard it as one of congenital disease of the pancreas. Another possible explanation would be that of a chronic colitis with secondary pancreatitis occurring in a case of congenital steatorrhœa. For the present it is best to regard it as a unique case, and be glad that the account of it has been so fully worked out.

REFERENCE.—¹*Quart. Jour. Med.* 1924, July, 358.

PARALYSIS, GENERAL. (*See DEMENTIA PARALYTICA.*)

PARALYSIS, INFANTILE. (*See POLIOMYELITIS.*)

PARALYSIS, TENDON TRANSPLANTATION FOR. (See TENDON TRANS-PLANTATION.)

PARATHYROID GLAND.

Ivor J. Davies, M.D.

Professor Noel Paton¹ reviews the present position regarding the functions of the parathyroids and the cause of the symptoms in tetania parathyreopriva and idiopathic tetany. He revives the Galenic name of thyreoid for thyroid. He indicates that tetany is a toxæmia due to the excess of guanidins, or more probably methylguanidins, in the blood. Symptoms identical with those seen in operative tetany and idiopathic tetany are produced by the action of guanidin and methylguanidins. The action of guanidin is twofold—first, stimulating the spinal outgoing neurones, and second, exciting the peripheral neuromyones in small doses, and paralysing in larger doses. Frank, Stern, and Nothmann² found that dimethylguanidin is eight times as toxic as the monomethyl, and that its poisonous effects are identical with spasmophilia.

While some observers believe that the parathyroids are able to act directly to detoxicate guanidin, Paton regards the parathyroids as producers of an internal secretion which controls the tone of muscle by regulating its metabolism, i.e., production or destruction of guanidin in the body. He states: "There is no doubt that a fall in the lime salts, especially if the nerve structures concerned in the maintenance of tone are sensitized either by methylguanidin or some other factor, may play an important part in determining the onset of symptoms, and that the administration of large quantities of calcium may overcome the influence of methylguanidin. But, on the other hand, it must be recognized that a decrease of calcium does not always exist when symptoms of tetany are present, and in uræmia a very marked fall may occur without symptoms of tetany."

Parathyroid Therapy.—Parathyroid extracts have been recommended in the therapy of a large number of conditions, but there has been no guarantee that the substance used contained the active principle of the parathyroid gland. Halsted has reported successful transplantations. He found that isotransplants failed to live, but that one autotransplant sufficed to keep an animal alive for months. Kreeke³ has reported five cases of *post-operative tetany* treated by the implantation of the parathyroids of the horse, which are large and easily found. Three of the cases were entirely cured, and two of the cures have remained well for one and one and a half years. The parathyroids were embedded under local anaesthesia in the preperitoneal tissue between the umbilicus and pubes.

M. Critchley⁴ remarks favourably upon parathyroid medication in the *Parkinsonian syndrome*, both primary and post-encephalitic in type. The salivation, sweating, disagreeable sensation of heat, and tremor are controlled. He recommends its administration in combination with hyoscine, which controls the hypertonus. Grove and Vines speak highly of the value of parathyroid extracts in certain chronic conditions such as *varicose ulceration of the leg*. Critchley has observed material benefit in eleven cases of *Graves' disease* after the administration of parathyroid.

For the relief of parathyroid inefficiency, i.e., tetany following thyroidec-tomy, the extract has always been ineffectual. Although many observers have from time to time reported beneficial results from parathyroid therapy in divers maladies, it can hardly be said that a single condition exists for which the use of parathyroid therapy rests on firm scientific foundation except the use of autotransplants in tetania parathyreopriva.

REFERENCES.—¹*Edin. Med. Jour.* 1924, Oct., 541; ²*Zeits. f. ges. exper. Med.* 1921, xxiv, 341; ³*Zentralb. f. Chir.* 1924, li, 39; ⁴*Practitioner*, 1924, July, 56.

PARATYPHOID FEVERS. (*See also* TYPHOID FEVER.) J. D. Rolleston, M.D.

MORBID ANATOMY.—S. Trentini,¹ who records a case of paratyphoid fever B in which the lesions were identical with those of typhoid fever, states that the following anatomical findings have been described as characteristic of paratyphoid: (1) The intestinal lesions present a diphtheroid appearance. (2) The ulcers are scanty, and are only rarely found in connection with Peyer's patches or the solitary glands. (3) They are present in the upper part of the intestinal canal as well as in the lower part down to the rectum. Some writers regard ulcers in the colon as typical of paratyphoid infection. (4) There is an absence, as a rule, of changes in the lymphatic system of the intestine, mesenteric glands, and spleen, in marked contrast with typhoid fever.

SYMPTOMS AND COMPLICATIONS.—Sabrazès, Flye Saint-Marie, and Larauza² record a case of *suppurative myositis* of the sternomastoid in convalescence from paratyphoid fever A, which had been complicated by intestinal hæmorrhage. A pure culture of streptococci was obtained from the pus.

L. Cornils³ reports an illustrative case, and has collected eight others from the literature exclusive of that reported by H. Mortimer Woolf (*see* MEDICAL ANNUAL, 1924, p. 330) of *perforative peritonitis* in paratyphoid fever. While this complication is usually fatal in typhoid fever in spite of laparotomy, recovery in the few recorded cases of perforation in paratyphoid is relatively frequent (in 6 out of 10), even though a comparatively long period may have elapsed between the occurrence of perforation and the operation. This difference in the prognosis of paratyphoid perforation is due to (1) the better general condition in paratyphoid, (2) the relatively small size of the perforation, and (3) the lesser degree of virulence of paratyphoid bacilli for the peritoneum. Cornils' case was that of a man of 35 admitted to hospital with the diagnosis of appendicitis. On laparotomy the appendix, apart from a small cicatrix, was found to be normal, but purulent peritonitis was present, and three small perforated ulcers were found 20 cm. above the ileocæcal valve. Twelve cm. of the affected gut were resected and an end-to-end anastomosis was performed. Subsequent recovery was uneventful.

J. L. van Bodegum⁴ relates a case of *concurrent malaria and paratyphoid fever B*. The patient was a man of 19, who was taken ill rather suddenly with a temperature of 103° and epistaxis. Examination of the blood showed numerous malarial parasites. A gramme of quinine was given daily for nine consecutive days, and the temperature showed a tendency to fall; but on the tenth day the quinine did not appear to have any effect, and the temperature rose rapidly. On the eleventh day the relatively slow pulse of 84 with a temperature of 102.4° suggested enteric, though the blood cultures and serum tests were negative. Rose spots appeared on the fifteenth day, and on the seventeenth day Vidal's test was positive (1:500) for *B. paratyphosus B*.

REFERENCES.—¹*Riforma Med.* 1925, 24; ²*Gaz. hebdomadaire des Sci. méd. de Bordeaux*, 1925, 107; ³*Deut. Zeits. f. Chir.* 1924, clxxxvii, 423; ⁴*Nederl. Tijds. v. Geneesk.* 1924, ii, 3251.

PEDICULOSIS.

E. Graham Little, M.P., M.D., F.R.C.P.

C. E. Corlette,¹ experimenting with numerous parasitocides in the treatment of this condition, prefers *Heliotropine*. Two formulæ were used by him: (1) A 5 per cent preparation in vaseline; (2) An oily lotion, containing heliotropine 5 parts, castor oil 30 parts, methylated spirit (without pyridine) 100 parts. Heliotropine is not expensive, and its pleasant odour makes it peculiarly applicable to children.

REFERENCE.—¹*Med. Jour. of Australia*, 1925, Feb., 185.

PELVIC BACKACHE. (*See* BACKACHE.)

PELVIC INFECTION, MILK INJECTIONS IN. *W. E. Fothergill, M.D.*

G. Gellhorn,¹ writing on this subject, points out that protein substances, if introduced by subcutaneous, intravenous, or intramuscular injection, have the faculty of stimulating the cells of the body to greater activity—of ‘activating the protoplasm’. The idea of protein therapy rests upon a non-specific basis. “It is now a definitely established fact that many infectious diseases can be cured by the introduction into the body of non-specific substances which in themselves have no relation whatever to the infection under treatment”. The writer pictures the inflamed and swelled tube helped in its warfare against the gonococcus and its products by the injection of a protein substance quite unassociated in its origin with gonococcal infection. Puerperal pelvic infection affords him another illustration. A very large number of proteins have been used for therapeutic injection. Of these, milk is probably the most extensively used at present.

Robert Schmidt, of Prague, who introduced it in 1916, selected it because it is always available and because its source, the organism of the cow, seemed to him as reliable as any chemical laboratory. It is sterilized by pasteurization, in the autoclave, or by boiling in a water-bath for ten minutes. The initial dose is 5 c.c., and the standard dose is 10 c.c., reached as a rule with the second or third injection. The interval is generally from three to five days, and the site of injection is the gluteal musculature. In mild cases one or two injections may suffice; the average number is about six. Intensity of reaction and clinical evidence of the patient's resistance usually indicate the dosage, the intervals, and duration of treatment. Gellhorn generally observed reaction six to eight hours after injection, a chill being followed by a rise of temperature to 103° or 104° in some cases. In twenty-four hours patients look and feel better. There is hyperleucocytosis on an average of 20,000 to 25,000 on the day following the injection. Focal reaction is on the whole insignificant. Anaphylactic shock need not be anticipated, as it is said to have occurred only thrice after many thousands of intramuscular injections of milk.

The principal field for protein therapy in gynecology is pelvic infections—acute, subacute, and recurrent, particularly cases of gonorrhœal origin. Puerperal pelvic infection also offers wide scope for the method. Gellhorn narrates six cases in detail, but does not give any figures dealing with his work in general. He regards protein therapy not as a method of treatment in itself, but as a means of setting in motion the same reactions which the organism uses to defend itself against disease. It has ample scope, but its limitations are very important. Contra-indications are cardiac decompensation, diabetes, and alcoholism. It may prove that pregnancy is another contra-indication. The weak point about all the recently tried methods of treating pelvic infections is that so many cases like those experimented upon do wonderfully well without any treatment at all.

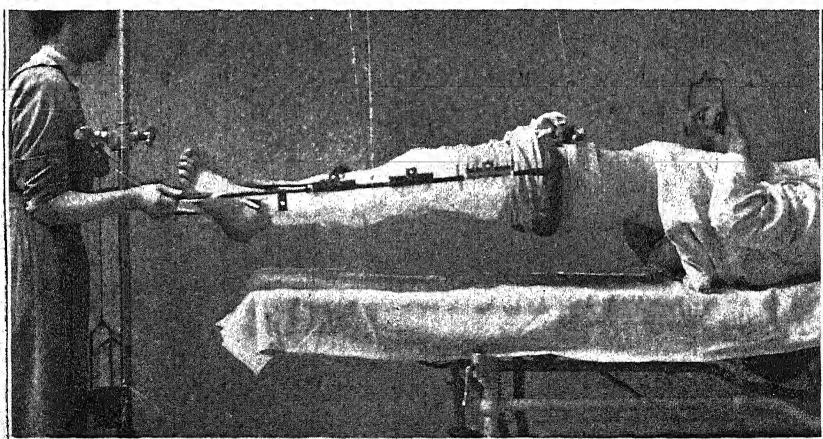
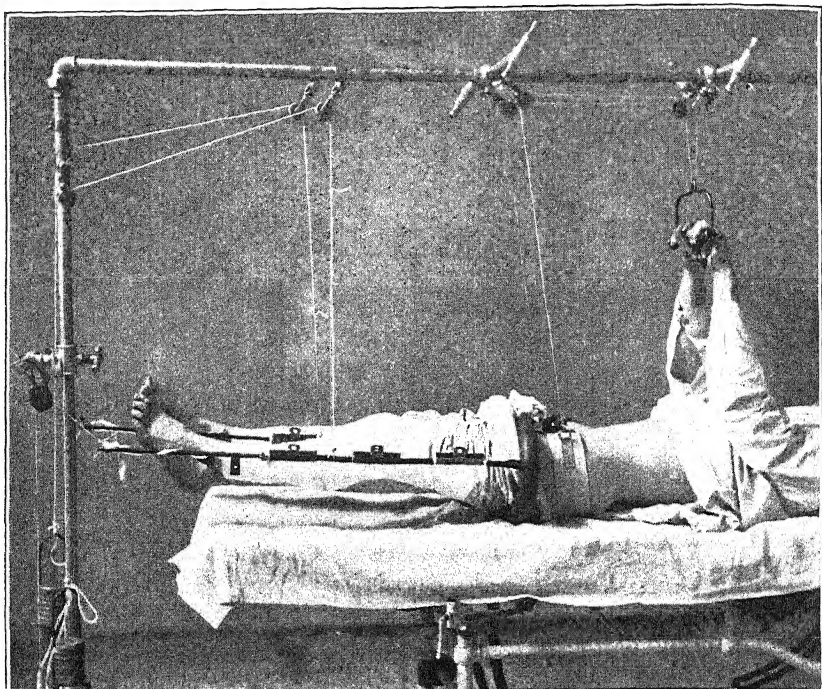
R. W. Mohler² writes on the same subject. He also has used milk injections in ten cases, giving five or six injections at weekly intervals. There were no patients with marked anatomical lesions who were improved to the extent that the lesions could not be recognized; but in all there was marked improvement in general condition, the pain became less, the patients gained in weight, appetite increased, and secondary anæmia improved. Thus the writer holds that protein therapy makes the patient feel better and will improve her general condition to the point where surgery may be undertaken with a minimum risk; while some patients will need no further treatment.

REFERENCES.—¹*Amer. Jour. Obst. and Gynecol.* 1924, Nov., 535; ²*Ibid.* 1925, March, 365



PLATE XLVI.

FRACTURE OF THE PELVIS



The upper figure shows the convenient arrangement for treatment of pelvic fractures.
Below, the patient is seen raised by his own aid for nursing purposes.

By kind permission of the 'Lancet'

PELVIC VARICOCELE. (*See VARICOCELE, PELVIC.*)

PELVIMETRY.

W. E. Fothergill, M.D.

S. J. Cameron and J. Hewitt¹ are dissatisfied with the results of the usual bimanual method of estimating the relative size of the foetal head and the maternal pelvis. They regard the method as unsatisfactory, because the examiner's single hand is incapable of exercising sufficient downward pressure in difficult cases. The position of semi-pronation of the examining hand renders accurate estimation of the cranial descent impossible. With the forearm in this position and the finger tips in contact with the lowest part of the head, the thumb will be found remote from the pubes and therefore cannot estimate the overlap. Even when the examining hand is fully supinated and the thumb placed on the side of the head, the estimation of the overlap cannot be made so accurately as is possible by external palpation with the other hand. Consequently the writers consider that in teaching and practice it will be necessary to revert to the discarded methods of Müller and Pinard. They suggest that the head be forced downward by an assistant, who can use two hands for that purpose, while the examiner, keeping his forearm supinated and the tips of his index and middle fingers on the lowermost part of the head, estimates the degree of descent. The amount of overlap should be estimated by unrestricted palpation with his other hand, which is free for that purpose.

The writers are incorrect in assuming that the bimanual method is universally illustrated, taught, and practised, and that the methods of Müller and Pinard are discarded. They are quite right in calling attention to the defects of a method which has, perhaps, gained unmerited popularity of recent years.

REFERENCE.—¹*Edin. Med. Jour.* 1924, Aug., 137.

PELVIS, FRACTURE OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The writer¹ has found the treatment of extensive fracture of the pelvis simplified by tightly fixing the bones with a girth of strong webbing, strapped around the bones between the trochanter and the ilium. A metal loop is fixed on either side of the girth for suspension to a Balkan frame, in the manner illustrated (*Plate XLVI*). Both legs are placed in Thomas's splints, with weights and pulleys attached to the end of the splints. If one side of the pelvis is raised, the heavier weight is placed on that side. The advantages from a nursing point of view are shown in the two illustrations. In the lower figure a nurse is seen holding the end of the splint to prevent the patient being pulled downwards by the weights and pulleys when he is raised from the bed.

Rupture of the Urethra.

—When this accident happens, either with or without fracture of the pelvis, it is highly desirable to open the bladder above the pubis in the first instance before any perineal incision is made. A metal catheter is passed in retrograde fashion and made to point in the perineum.

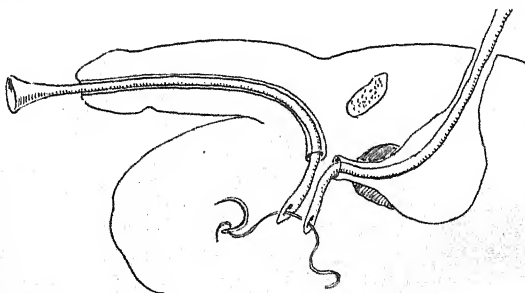


Fig. 38.—Fracture of the pelvis. Catheters passed and made to point in perineum. (The instrument passed in retrograde fashion should be metal.)

Throughout the operation this is held in position by a nurse. An incision is then made in the perineum so as to expose the catheter, thereby revealing at once the proximal portion of the rupture. A rubber catheter is then passed through the penile portion, and the two are connected in the manner shown in Fig. 38. The metal catheter passed through the suprapubic wound is then withdrawn, bringing with it the soft catheter introduced by the penile route.

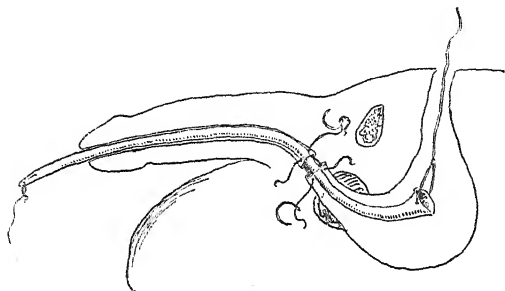


Fig. 38.—Fracture of the pelvis. Urethra sutured with catheter as a guide. Note the thread coming through suprapubic wound. (Figs. 39, 40 by kind permission of the 'Lancet'.)

The catheter is pulled out through the suprapubic wound, and a silk thread is attached to it before re-introducing it into the bladder. The urethra is then carefully stitched with fine catgut over the catheter (Fig. 39). The silk thread protrudes through the suprapubic wound. An additional rubber tube drain is inserted. In four or five days a change of catheter becomes necessary; this is usually accomplished

by attaching it to the thread which protrudes above the pubis, and pulling on the penile end of the catheter, or vice versa.

REFERENCE.—¹*Lancet*, 1925, ii, 313.

PEMPHIGUS.

E. Graham Little, M.P., M.D., F.R.C.P.

G. W. Wende¹ reports upon results of treatment suggested by R. H. and W. D. Davis. A combination of 0.065 grm. Iron Cacodylate with 1.5 c.c. of a 3 per cent solution of Coagulen, the first given intravenously, the second subcutaneously, was administered on alternate days, for an average period of six weeks, in 7 cases of women, ranging in age from 21 to 66, and 3 men of ages from 18 to 75. It is claimed that the series showed 5 clinical cures and 3 improvements, all occurring during a period of nine months; one patient died of an intercurrent disease; and, in one, too short a time had elapsed since the treatment to make any statement. Comment upon these results, at the meeting at which the paper was read, showed little confirmation in the experience of others of the results reported by the author.

Acute Septic Pemphigus.—Eberson in 1923 claimed to have found the same bacterium in a series of seven cases of acute pemphigus; it was Gram-positive, anaerobic, non-motile, coccoid in form but also resembling a streptobacillus in certain respects, pathogenic to guinea-pigs and rabbits, and possessed definite toxic properties. A. Schalek² reports another case in which cultures on brain-glucose broth from the blood and a bulla showed a bacillus which he regards as identical with that described by Eberson. The patient was a Swede, age 72, who was in good health up to the time of a fall in which he bruised his elbow. Ten days later he developed vesicles on the forearms, and this eruption quickly spread on the body and to the mucosæ. Temperature rose during the third week, and he died five weeks after the fall.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1925, June, 783; ²*Ibid.* Feb., 232.

PERICARDITIS, ELECTROCARDIOGRAPHY IN. (See HEART, EXAMINATION OF.)

PERITONITIS, SURGERY OF.

E. Wylllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

The treatment of peritonitis by *lymphaticostomy* of the thoracic duct in the neck, introduced by Costain¹ several years ago, has not lived up to its early promise. The reviewers have had opportunity to observe several cases in which this operation was performed, and in no case did any benefit result. Other surgeons have had the same experience, although little of this has found its way into the literature as yet. However, two very interesting pieces of experimental work are reported which serve to support these conclusions. L. D. McGuire² injected cultures of *B. prodigiosus* into the peritoneal cavity of dogs and failed to recover the organism in the lymph from the thoracic duct even in cases where a paralytic ileus had been produced by trauma to the intestines. The work of H. H. Cox and L. B. Bell³ yielded similar results. In fact, the general trend of their experiments suggested that the lymph drainage hastened rather than prevented death. The natural conclusion from this work is that the operation has no place in the treatment of peritonitis until it can be supported by better experimental data than we have at hand now. Furthermore, as the latter workers suggest, the lymphaticostomy itself is not without danger. The position of the duct is far from constant. Its size varies within a wide range of limits, and it may be multiple. The exposure may necessitate digging around into the mediastinum, and if many are done there is bound to be a certain percentage of injury to the great veins. Such an extensive surgical procedure on a patient already in grave condition cannot be looked upon as justified unless a very real benefit is ensured, which, unfortunately, we are not in a position to guarantee.

Armstrong,⁴ in a very brief communication, presents the case against meddling surgery in peritonitis in a forceful manner:—

"The treatment of peritonitis involving the pelvic and small intestine area is extremely simple. The operating surgeon only needs courage—the courage to stay his hand. Let the technique be to deal with the cause of the infection as gently as possible. Pass a small soft rubber tube or an accordion drain nearly, but not quite, to the bottom of the pelvis (*gauze should not be used*), place the patient in the Fowler position, and give saline per rectum or intravenously if necessary, and withhold food until the bowels move. The tube is not for drainage but to allow enough fluids to escape to relieve the intra-abdominal tension and thus facilitate the circulation through the blood- and lymph-vessels.

"All patients with general peritonitis treated in this way will recover if the treatment is instituted before paralytic obstruction has developed. Those who have courage to carry out this treatment will have no mortality in general peritonitis."

Our grandfathers used to cure many of their cases with morphine alone in days before surgery was thought of in such cases. Absolute rest, preventing the spread of the infection and allowing time for localization to occur, will in a large majority of cases result in either complete resolution or the formation of a walled-off abscess, generally in the pouch of Douglas. Nather and Ochsner⁵ call attention to the frequency of this termination when proper localizing measures are instituted. Drainage can often be made into the rectum in a manner causing little inconvenience to the patient, and not carrying any risk of spreading the infection by operative procedures or of causing the large ventral hernias which follow anterior drainage in such a distressingly high percentage of cases.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1923, xxxvi, 365; ²*Ibid.* 1925, May, 626; ³*Ann. of Surg.* 1925, May, 911; ⁴*Surg. Gynecol. and Obst.* 1925, June, 760; ⁵*Ibid.* 1925, Feb., 258.

PERNICIOUS ANÆMIA. (See ANÆMIA, PERNICIOUS.)

PHARMACOLOGY AND GENERAL THERAPEUTICS. *Ivor J. Davies, M.D.*

Allonal.—This synthetic product is a combination of allyl-isopropyl-barbituric acid and phenyl-dimethyl-dimethylamino-pyrazolon (amidopyrin or pyramidon). It is a yellow powder, bitter in taste, slightly soluble in water and easily soluble in alcohol. The tablets contain 1 gr. of the barbituric acid compound and $1\frac{2}{3}$ gr. of amidopyrin. The dose is from one to four tablets. Its properties are sedative, hypnotic, and analgesic. J. F. Quigley and Hugh Quigley¹ speak of it as "a potent substance, marvellously efficacious in many conditions, and free, as far as we can judge, from the evil effects consequent upon the use of morphine and other well-known analgesics." These observers refer to the articles of M. A. Burns.²

Cocaine for Euthanasia.—E. G. Chandler³ strongly recommends the use of cocaine in the terminal stages of *phthisis*. The rapid deterioration and the abdominal discomfort which follow morphia are not seen after cocaine administration. It is when "the patient becomes apprehensive, restless, sleepless, coughs much, is wasted to a shadow, and his bony points pain him, when his throat and larynx are ulcerated, and it hurts him to speak, to swallow, and even to breathe," that cocaine becomes useful. Chandler gives $\frac{1}{4}$ gr. of the hydrochloride hypodermically, and $\frac{1}{4}$ gr. dissolved in some lemon-juice and water with sugar to be sipped. Both can be repeated.

Digitalis (see also HEART DISEASE, GENERAL THERAPEUTICS).—G. C. Robinson, P. D. White, C. Eggleston, and R. A. Hatcher,⁴ at the request of the Council on Pharmacy and Chemistry (U.S.A.), report on the therapeutic use of digitalis, with special reference to its intravenous injection.

The Committee conclude with these recommendations:—

"The oral administration of digitalis in the form of the standardized powdered leaf, infusion, or tincture, meets every requirement of digitalis therapy, with the exception of those relatively infrequent cases in which immediate relief (within two hours) is imperatively demanded, or when nausea or vomiting precludes the oral method.

"When the threatening condition of the patient demands immediate relief and there is no contra-indication for the use of digitalis bodies, strophanthin or crystallized ouabain should be injected intramuscularly or intravenously. Great care must be exercised in this method of using any digitalis body in patients who have recently received digitalis or any of its substitutes.

"When nausea or vomiting due to causes other than digitalization precludes the oral administration, tincture of digitalis may be administered by the rectum until nausea or vomiting has ceased, after which the digitalis may be administered orally if it is required.

"Ouabain may be kept in hard glass ampoules or in buffered solution (i.e., one in which sodium phosphate maintains a neutral reaction) for several months without appreciable change. Physicians should see that pharmacists have available hypodermic tablets containing 0.1, 0.25, and 0.5 mgrm. ($\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$ gr.). These may be dissolved in 1, 2.5, or 5 c.c. (15, 40, or 75 min.) of sterile physiological sodium chloride solution and injected intravenously or intramuscularly.

"The proprietary preparations of digitalis and its principles have no advantage over digitalis, crystalline ouabain, and amorphous strophanthin."

Doses for Children.—An easy method of calculating these doses is suggested by A. D. Bush.⁵ Multiply the age of the child by five, and the resulting product will be the correct percentage of the adult dose suitable for a child of that age.

Dye Therapy.—It has been established that dye therapy is of value in the treatment of infected tissues; but much of the knowledge gained as yet cannot be applied to clinical work. The active fraction of the molecule of many of the antiseptic dyes is unknown. Recently attempts have been made to increase the bacteriostatic power of the dyes by various measures, e.g., heat, by Churchman⁶ on gentian violet. Burke and Grieve⁷ have shown that an increase in alkalinity increases the action of many of the dyes on bacteria. Davis⁸ states that acriflavine inhibits staphylococcus and *B. coli* in an alkaline urine (pH 8.0) in a dilution of 1–100,000, while in an acid urine (pH 6.0) it is almost equally effective for staphylococcus, but loses most of its action for *B. coli*. It has also been shown that an increase in alkalinity decreases the bactericidal action of at least one dye, acid fuchsin. The alkali used seems to be immaterial: sodium hydroxide, alkaline phosphate, sodium carbonate, and sodium bicarbonate all increase or decrease the action of the dyes. If alkali increases the action of a dye on one species, it is advisable to apply it with the dye in question in the treatment of infection with other organisms. Davis has shown that the action of acriflavine is greater in alkaline than in acid urine. The administration of 4 to 12 gm. of sodium bicarbonate by the mouth will cause the urine to become strongly alkaline in a few hours, a pH of 8.7; 2 to 4 gm. three times a day will keep the urine alkaline. Alkalinization of the urine should therefore always precede the treatment of bladder and urethral infections with dyes. Empyema fluids can be washed out with an alkaline wash before the application of the dye.

Many observers have shown that some of the dyes are toxic when administered intravenously. If used, this should be with caution, and never more than 5 mgrm. per kilo. body-weight should be injected intravenously. The solution should be made fresh in normal saline prepared from freshly distilled water. There is also some danger in excessive alkalinization, especially in cases where there is renal abnormality. This does not apply to local alkali administration. The action of the following dyes is increased in the presence of alkali: crystal violet, methyl violet, gentian violet, brilliant green, basic fuchsin, the flavines, and malachite green. F. McKelvey Bell⁹ reports on the use of neutral acriflavine, which he administers intravenously to adults and intracolonically for children; 50 c.c. of $\frac{1}{2}$ per cent solution was the average dose for an adult. Women are much more inclined to nausea and vomiting after the use of large doses than men. Injections cannot be repeated more than four or five times at intervals of one week without causing symptoms which may become alarming. In acute conditions the maximum doses are given; but if there is no definite result following the second dose, subsequent doses seem to be useless and sometimes harmful. Within a few minutes of the injection of about 50 c.c. of $\frac{1}{2}$ per cent solution of neutral acriflavine, the skin assumes a yellow appearance. This remains for forty-eight hours. The dye appears in all the secretions within a few hours. Old people stand the treatment badly. Albuminuria and old age are contra-indications. If any of the solution becomes extravasated in the tissues while injecting it intravenously, a chemical cellulitis is set up, similar to that with salvarsan. McKelvey Bell reports several cases of acute infections which were rapidly benefited by the aniline group of dyes. Gonorrhœa seems to be unaffected.

Hexamethylenamine.—Hexamethylenamine itself possesses no antiseptic power, but has been used especially for urinary infections from the fact that formaldehyde is liberated by hydrolysis. This liberation depends on the hydrogen-ion concentration of the medium. The degree of decomposition increases with the degree of hydrogen-ion concentration, although Trendelenburg reports an appreciable decomposition on the alkaline side of neutrality.

The fate of hexamethylenamine and its bearing in antiseptics have been the subject of a paper written by Floyd de Eads.¹⁰ He shows that there is a great variability in the total amount of hexamethylenamine excreted in the urine after oral administration, ranging from 32 to 85 per cent. Sodium bicarbonate augments the excretion. This neutralizes the HCl of the stomach, and thereby increases the excretion of the drug in virtue of the decreased hydrolysis of the drug before absorption. Some of Eads' results also indicate the possibility of some liberation of formaldehyde in the blood and other tissue fluids. "It appears, therefore, that formaldehyde, as precursor of formic acid, is liberated in the tissues. However, the concentration at any given moment is much too low for antiseptics, amounting to about 1-500,000 at best, in a subject receiving 2.5 gm. of hexamethylenamine, or in other words about one-twentieth of the concentration (1-25,000) necessary for antiseptics." Therefore there is no sound basis for the use of hexamethylenamine orally or intravenously, as a systemic antiseptic. The excreted formic acid is too small in amount to account for the benefits reported.

Mercurochrome.—Justina H. Hill and Charles Y. Bidgood,¹¹ from the Department of Urology of the Johns Hopkins University, record the results of their experiments on rabbits of the effect of intravenous injection of mercurochrome on the kidneys. They conclude: "It may be said that intravenous mercurochrome causes a mild reaction in the kidney which is directly proportional to the dose given. There is no actual destruction of tubular epithelium from doses as high as 7.5 mgrm. per kilo. of body-weight, but with 10 mgrm. per kilo. there is definite renal damage, so that it would be unwise to use so large a dose clinically. Repeated injections do not cause any added damage, and can be given, as in these animals, as often as twice a week with safety, provided a dose of 5 mgrm. per kilo of body-weight be not exceeded. The slight damage is not irreparable, and at the end of two months the kidneys show no evidence of any previous lesion."

H. H. Young and Konrade Birkhaug¹² report a case of scarlet fever complicated with erysipelas and streptococcus septicæmia cured by intravenous injection of mercurochrome-220 soluble. The technique adopted by them is first described. The ordinary tablets of mercurochrome-220 soluble are used, and a simple 1 per cent solution made with hot distilled water.

They recommend that at least 5 mgrm. per kilo. of body-weight should be employed; this amounts to about 23 c.c. of a 1 per cent solution to each 100 lb. of the patient's body-weight. In some cases marked nausea and severe diarrhoea follow the intravenous injection, but this ceases after a day or two. They endeavour to introduce the drug in sufficient quantity to sterilize the blood and if possible the local focus, and for this reason the initial dose should be large. They have never used more than 8 mgrm. per kilo. The treatment is not repeated for several days and then only if necessary. A reference is made to a previous communication by H. H. Young and Justina H. Hill¹³ on the treatment of septicæmia and local infections by intravenous injections of mercurochrome-220 soluble and of gentian violet. A case of very severe scarlet fever in a child with complications is fully described. A blood culture on the ninth day of the disease revealed an infection by the *Streptococcus hæmolyticus*. Dochez' antistreptococcic scarlatinal serum was injected intramuscularly on the day after admission (the eighth day of the disease), but without benefit. The patient's condition was becoming desperate, and 15 c.c. of a 1 per cent solution of mercurochrome, equal to 7.5 mgrm. per kilo. of the patient's body-weight (20 kilo.), was given on the eleventh day of the disease. An immediate and remarkable improvement ensued within twenty-four hours. The temperature dropped from 105° to 101°, and the pulse from 140 to 98 in

fifteen hours. The most striking feature was the complete sterilization of the blood in twelve hours after the injection. The patient was discharged cured eight days later.

The details of a case of streptococcus pneumonia are also described from a report received from Dr. G. Martyn, of Los Angeles. Blood culture disclosed a pure infection by the *Streptococcus haemolyticus*. The patient's condition was very grave when the article on mercurochrome-220 soluble² was seen; 20 c.c. were given intravenously, 5 mgrm. of a 1 per cent solution being allowed to each kilo. of body-weight. The temperature fell from 105° to 99.6° over-night, and the pulse from 140 to 96. All the joints were swollen, and a rapid subsidence followed the injection. An early and complete recovery resulted. These observers fairly claim that the drug was responsible for recovery in the two cases of the report.

Mercurochrome by Mouth.—Sufficient evidence has been secured to convince H. H. Young, W. W. Scott, and J. H. Hill¹⁴ that mercurochrome given by mouth is innocuous, and that it causes little or no gastro-intestinal disturbance until it has been taken in big doses for a week or more. In a dosage of 900 mgrm. of mercurochrome daily, the urine shows colorimetrically a dilution of between 1-30,000 and 1-40,000 and occasionally 1-15,000 to 1-20,000 (varying according to the intake of water). At this strength urine is bacteriostatic. The stools become deeply stained, almost brick-red in colour, and the normal bacterial content may be greatly reduced. The few clinical trials made indicate that a distinct germicidal effect in the urinary tract can be obtained by administering mercurochrome by mouth.

(1) Attachment for head of cylinder (A). This consists of a pressure gauge (B), reducing valve (C), and flow regulator (D). The gas escaping from the cylinder is led by the tube (E) to

(2) A box, where it passes through the flow-meter (F), and tends to accumulate in the bag (G). The oxygen then enters the water valve (I) by the wide lead-in tube (H). The water valve stands inside a vessel (J), into which hot water may be poured in order to warm the oxygen. The oxygen is then led by wide corrugated rubber tubing (K) to

(3) A face mask (L) or a 'forked nasal tube' (O). The mask is of special design and has an expiratory valve (N) and an extra-air orifice (M). It is attached to the head by a broad band of elastic webbing. The forked nasal tube is held in position by a forehead band. In each case the oxygen delivery tube passes from behind the patient's head so that the patient is enabled to move freely without kinking or lying on the tube. (Re-drawn from the 'Edinburgh Medical Journal'.)

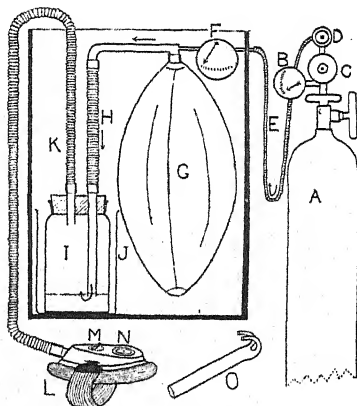


Fig. 40.—Diagram of Davies and Gilchrist's modification of Haldane's oxygen apparatus.

Oxygen Therapy.—The object in giving oxygen is to increase the oxygen saturation of the blood so that anoxæmia cannot develop, and to abolish cyanosis or prevent its development. Again, if oxygen is to be of any value it must be resorted to early. H. Whitridge Davies and A. R. Gilchrist,^{15, 16} in an interesting paper, remark that "it is necessary to raise the percentage of oxygen in the alveolar air considerably above the normal level in order to give the oxygen a greater *vis a tergo* in its passage through the damaged alveolar epithelium". The old 'tube funnel' method is certainly useless, and waste of oxygen serious. This waste can be avoided by conserving the gas during

expiration. Macleod¹⁷ states that by having the oxygen administered through a nasal catheter and closing the other orifice with the finger, he was able to obtain better results. Haldane¹⁸ in 1917 devised a method in which the gas was automatically conserved during expiration. Davies and Gilchrist, in their paper, describe their modification of the Haldane apparatus (*Fig. 40*). In this the oxygen passes from the cylinder into a bag of 4- to 5-litre capacity, where it accumulates. The oxygen is led from this into a glass wash-bottle containing water. This acts as a valve, as the lead-in tube just dips under the surface of the water. From this the oxygen passes through a tube connected with a mask by means of which it is possible to regulate the amount of room air inspired by the patient. "This is accomplished by having an expiratory valve, a tube leading in the oxygen, and also an inspiratory orifice of variable size to admit extra air. With the latter completely closed, the demand made by inspiration can be satisfied only from the oxygen inflow, which must be so adjusted as exactly to satisfy this demand". During inspiration the negative pressure produced draws oxygen from the bag, but during expiration the positive pressure is sufficient to open the expiratory valve on the front of the mask, and patient expires to the outside air. At the same time this positive pressure is transmitted along the tube to the water valve, and should be sufficient to stop all bubbling and waste of oxygen. Davies and Gilchrist conclude that if oxygen therapy be given early and wisely, the mortality from pneumonia could be reduced, the severity of the symptoms markedly lessened, and a speedier termination of the infectious process assured. The oxygen outfit described by them is made by Messrs. Siebe, Gorman & Co., 187, Westminster Bridge Road, London, S.E.1.

REFERENCES.—¹*Prescriber*, 1924, Dec.; ²*N. Y. Med. Jour.* 1922, April 19, 491, and *Med. Jour. and Record*, 1924, Jan. 16, 116; ³*Lancet*, 1924, Sept. 20, 629; ⁴*Jour. Amer. Med. Assoc.* 1924, Aug. 16, 504; ⁵*Med. Jour. and Record*, 1924, Dec. 17, 184 (Suppl.); ⁶*Johns Hop. Hosp. Bull.* 1922, xxxiii, 227; ⁷*Amer. Jour. Med. Sci.* 1924, July, 98; ⁸*Jour. of Urol.* 1921, v, 215; ⁹*Med. Jour. and Record*, 1924, Nov. 5, 437; ¹⁰*Arch. of Internal Med.* 1924, Oct., 511; ¹¹*Johns Hop. Hosp. Bull.* 1924, Dec., 409; ¹²*Jour. Amer. Med. Assoc.* 1924, Aug. 16, 492; ¹³*Ibid.* March 1, 669; ¹⁴*Jour. of Urol.* 1924, Sept., 237 (abstr. in *Jour. Amer. Med. Assoc.* 1924, Nov. 8, 1538); ¹⁵*Edin. Med. Jour.* 1925, May, 225; ¹⁶*Lancet*, 1925, i, 916; ¹⁷*Physiology and Biochemistry in Modern Medicine*, 4th ed., 1922, 449; ¹⁸*Brit. Med. Jour.* 1917, i, 181.

PHARYNX, PULSATING SWELLING IN. A. J. M. Wright, M.B., F.R.C.S.

This condition causes no symptoms and is usually discovered by chance. It is recognized as a pulsating bulging in the postero-lateral region of the pharynx, on either one or both sides (*Plates XLVII, XLVIII*). In the past, a variety of opinions have been expressed as to the identity of the pulsating vessel, but Brown Kelly¹ has no doubt that it is the internal carotid. Tortuosity of this vessel has been recognized by anatomists for many years. The condition is more common in females than in males, and is met with mostly in the young and the aged. It is more often situated on the right side than the left. The condition is probably due to a congenital abnormality. The diagnosis should offer no special difficulty, the usual features being sufficiently distinctive, viz., the smooth not very pronounced bulging, pulsating synchronously with the heart, and covered with healthy mucous membrane; its situation in the postero-lateral region of the pharynx and mainly on a level with the tonsil; its frequent bilaterality; the absence of symptoms attributable to it; its identification as the internal carotid by palpation and pressure; and its unchanging size over periods of months and years. It is surprising that accidents resulting from damage to such a vessel are extremely rare.

REFERENCE.—¹*Jour. Laryngol. and Otol.* 1925, Jan., 15.

PLATE XLVII.

PULSATING SWELLING IN THE PHARYNX

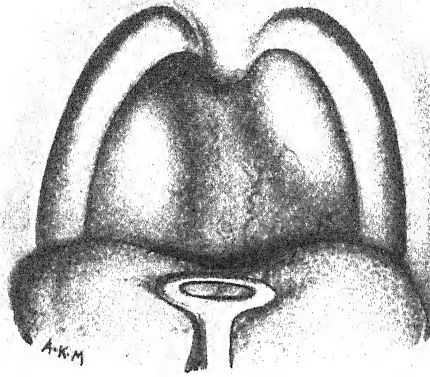


Fig. A.—Very prominent artery on both sides of pharynx.

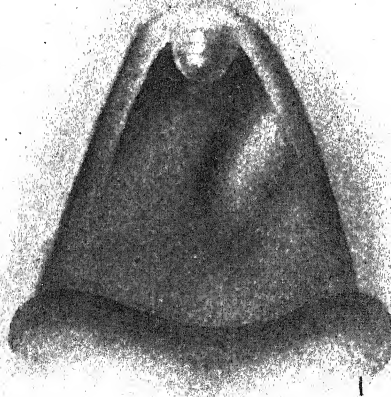


Fig. B.—Large pulsating vessel on posterior wall of pharynx.

Plates XLVII, XLVIII, by kind permission of Dr. A. Brown Kelly and the 'Journal of Laryngology and Otology'

PLATE XLVIII.

PULSATING SWELLING IN THE PHARYNX—*continued*

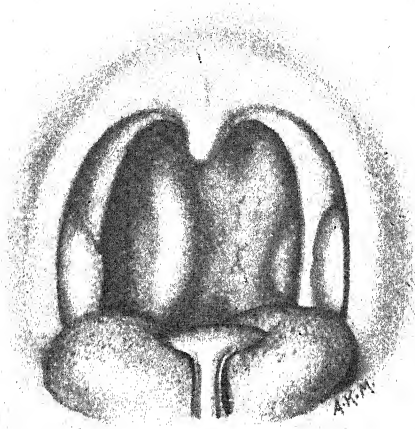


Fig. C.—Prominent vessel on right side passing over posterior wall, and on left side bulging lateral wall of pharynx.

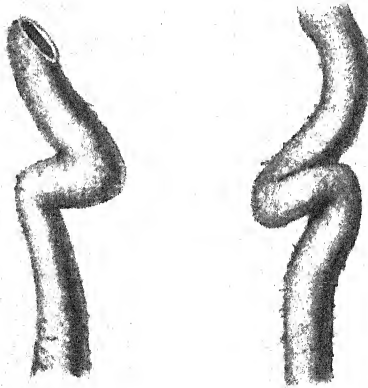


Fig. D.—Tortuosity of internal carotids right and left.

PITUITARY GLAND.

Ivor J. Davies, M.D.

Active Principles.—J. J. Abel¹ believes the bovine posterior lobe, including the pars intermedia and hypophysial stalk, contains only one specific hormone, which he has isolated in the form of a tartrate. This tartrate displays all the physiological principles of a good aqueous extract of the posterior lobe of the hypophysis. The posterior lobe also contains in small amounts two depressor substances. One is histamine. The other differs in being insoluble in chloroform; it has the properties of an albumose and gives the biuret reaction. Dale² and Dudley,³ on the other hand, uphold the idea that there are at least three or four specific hormone principles existing in the posterior lobe extracts. Abel in his paper gives a detailed account of his tartrate method of isolation.

Diuretic and Antidiuretic Action of Pituitary Extracts.—Schafer⁴ and his co-workers discovered the diuretic action of extracts in 1906. In 1913 von den Velden made the important discovery that the administration of pituitary extracts sub cutem, to normal individuals as well as to patients suffering from chronic renal disease, causes the kidneys to secrete less urine. He also found the extract most efficacious in a case of *diabetes insipidus*. Abel believes the diuretic effect produced by pituitary preparations in experiments in animals to be of transient duration, and that the more important action in normal human beings as well as those with diabetes insipidus is antidiuretic. After the injection of pituitary extract, "the excessive flow will cease, the thirst will disappear, and the individual will soon be made quite comfortable. This drug removes the symptoms in almost all cases of diabetes insipidus, and is therefore of the greatest service to those afflicted by the disease".

W. E. Dixon⁵ has brought forward some evidence to show that the active hormone of the posterior lobe is passed into the cerebrospinal fluid. His experiments are based on the uterine contracting power of the fluid. They have been confirmed by Trendelenburg.⁶

REFERENCES.—¹*Johns Hop. Hosp. Bull.* 1924, Oct., 305; ²*Biochem. Jour.* 1909, iv, 427; ³*Jour. Pharm. and Exper. Therap.* 1919, xiv, 295; ⁴*Proc. Roy. Soc. London*, 1906, lxxvii, 571; ⁵*Jour. Physiol.* 1923, lviii, 129; ⁶*Berl. klin. Woch.* 1924, lxi, 777.

PITUITARY TUMOURS. (See BRAIN, TUMOURS OF.)

PLACENTA PRÆVIA.

W. E. Fothergill, M.D.

An important discussion upon the treatment of placenta prævia introduced by Professor B. P. Watson and Dr. Douglas Miller¹ leaves certain impressions. The first of these is that vaginal packing is a dangerous and unnecessary method of treatment. It was denounced many years ago because it was so frequently followed by septic infection. In hospitals it may be possible to use plugs and still avoid sepsis, though this is doubtful; but in private houses the practitioner who gives up obstetric packing altogether is a wise one. The use of Champetier de Ribes' bag in placenta prævia has also been followed by infection in many cases. It is recognized as a frequent cause of bad lacerations of the cervix extending into the lower uterine segment—rupture of the uterus, in short. This is not to the discredit of the bag, which was never intended by its inventor to be used in placenta prævia. It was designed for the induction of premature labour.

Another point is the growing popularity of Cæsarean section in placenta prævia. This, no doubt, is due to the fact that it saves the child, which is often lost when other methods of treatment are used. There is much to be gained by regarding cases as falling into one of two great classes. In one the cervix is more or less dilated, or at least is softened and dilatable. In the other the cervix is still undilatable but bleeding has begun. It may be impossible

to be sure whether the case is one of accidental or of unavoidable hæmorrhage. In the first class it is generally possible to complete dilatation, deliver a living child by forceps or turning, and also to save the mother. But with the undilatable cervix, especially in primiparous cases, Cæsarean section offers great advantages over all other methods.

REFERENCE.—*Edin. Med. Jour.* 1925, April, 55.

PLAGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—A. G. M. Severn¹ records an outline of the history of plague in Hong Kong, where Haffkine's vaccine has given disappointing results, and reliance is now placed on 'general house-cleaning' by a permanent staff, general rat poisoning twice a year with pellets of barium carbonate and molasses, and rat-bins attached to lamp-posts for the reception of dead rats, in which two to three thousand rats are collected weekly, their distribution giving a clue to the infected districts. No cases have been notified since September, 1923. In Los Angeles² a severe outbreak of pneumonic plague has occurred, with 12 deaths out of 13 cases, and it was thought to be complicated with influenza. In Java, L. Otten³ describes the failure of evacuation, fumigation, and disinfection measures after twelve years' experience, and he regards rat-proof construction as the only remedy. Vaccine prophylaxis was disappointing, the mortality only being reduced by 50 per cent and the morbidity much less. The Union of South Africa Public Health Department have issued a valuable memorandum⁴ instructing medical men what to do and how to send specimens for examination on the outbreak of plague, which is worthy of careful study by those working in plague areas. C. D. Tiwari and R. B. Lal⁵ found that by ordinary fumigation of houses the fleas and rats were not killed in the rat-holes, but that both the rats and the fleas are killed in five minutes by 'neem-batti'; this consists of pot. chlor. 2 drachms, pot. nit. 1½ drachms, and sulphur 2 drachms, powdered and mixed together, with 5 drachms of mustard or castor oil to form a paste, followed by the addition of 1 drachm of red pepper and a handful of crushed dried neem leaves; this is placed in the rat-holes over a 9-in. wick of cloth soaked in a saturated solution of potassium chlorate, and ignited, all the holes being closed.

J. Morison and C. R. Avari⁶ have tested on susceptible Madras rats the immunizing value of Haffkine's plague vaccine and of agar cultures, and found the value of the former to reside in the supernatant fluid, which was less toxic than the whole vaccine, while the sediment had no immunizing value, so may be omitted with advantage.

TREATMENT.—R. D. Pal⁷ reports serious œdema of the glottis resulting from the intravenous injection of 10 min. of iodine solution in a case of plague.

REFERENCES.—¹*Jour. State Med.* 1925, June, 274; ²*Jour. Amer. Med. Assoc.* 1924, Nov. 8, 1507; ³*Ibid.* Aug. 2, 396; ⁴*S. Afric. Med. Record*, 1925, April 11, 146; ⁵*Ind. Med. Gaz.* 1925, July, 316; ⁶*Ind. Jour. Med. Research*, 1924, Oct., 313 and 321; ⁷*Ind. Med. Gaz.* 1924, July, 348.

PLEURODYNIA, EPIDEMIC, or 'DEVIL'S GRIP.'

W. H. Wynn, M.D., F.R.C.P.

In 1888 W. C. Dabney¹ described an epidemic resembling dengue which occurred in Virginia and was characterized by very severe pain in the chest. During 1923 a similar condition became prevalent in the Middle Atlantic States, and references in the daily papers to 'devil's grip' became frequent. Payne and Armstrong² described cases under the term 'epidemic transient diaphragmatic spasm'. Hanger, McCoy, and Frantz³ the same year reported an epidemic of pleurodynia, and considered the syndrome constituted a clinical

entity characterized by sudden onset, pain in the chest or epigastrium, fever of brief duration, and a tendency to recurrence on the third day. R. G. Torrey¹ gives a good description of the condition. The onset is sudden, often with a distinct chill, the temperature rises to 102° to 104°, and the pulse may be very rapid. It is slow in periods of comfort, but rises on efforts to breathe. Pain is the main symptom, occurring in the epigastrium or back or the lower part of the chest. It is aggravated by breathing or movement, increased during the febrile attacks, and less when the temperature drops. It is so severe at times as to make breathing almost impossible. With the pain there is very marked tenderness. Fever and pain come on and diminish together. There may be only one attack, but usually there are recurrences with intervals of twenty-four or forty-eight hours. Headache may be severe and persistent, and there is profuse sweating. There is an absence of cough or signs of lung involvement. Pleural friction was not heard. There were no deaths. As a rule recovery was prompt and complete and there were no complications. Tenderness in some cases persisted for some time, and after a severe attack patients felt weak for a long time. Torrey regarded the condition as due to an acute infection probably of protozoan origin. The pain seemed to be due to involvement of the diaphragm or diaphragmatic pleura. J. C. Small⁶ supported the protozoal origin on account of the absence of a leucocytosis, the sudden decline of fever with cyclic recurrences, the absence of inflammatory foci, and an increase of eosinophils. He observed inclusions in the red cells of patients which he regards as an undescribed plasmodium, differing from the malarial organism in morphology and staining characters (Fig. 41).

During the summer of 1924 a few outbreaks of an epidemic form of pleurisy occurred in England, and were recorded by Bruce W. Williamson;⁶ W. Attlee, A. M. Amsler and D. C. Beaumont;⁷ and Eric Lloyd.⁸ Forty-eight cases occurred in a large public school, 13 in one children's hospital, and 5 in another. In onset and symptoms the cases closely resembled those described above as epidemic pleurodynia. In the American cases pleural friction was not heard, whereas it is recorded in 24 out of 61 of the English cases. When heard it was very loud, so that patients could hear and feel the creak. The absence of cough and of signs of effusion or lung involvement was noteworthy, and suggests that the sounds may have been produced in the underlying chest wall.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1888, Nov.; ²*Jour. Amer. Med. Assoc.* 1923, Sept., 746; ³*Ibid.* 826; ⁴*Amer. Jour. Med. Sci.* 1924, Oct., 564; ⁵*Ibid.* 570; ⁶*Lancet*, 1924, ii, 64; ⁷*Ibid.* 492; ⁸*Ibid.* 272.

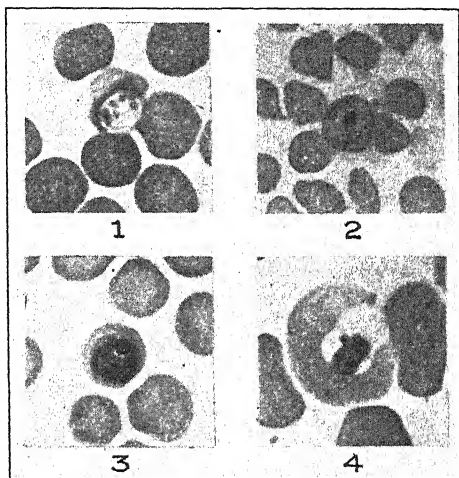


Fig. 41.—Epidemic pleurodynia: *Plasmodium pleurodynia* within erythrocytes (Wright's stain). 1, 2, 3, 4, show the magnifications of $\times 1500$, $\times 800$, $\times 1200$, and $\times 1600$ respectively. The first three are from the same case. (By kind permission of the *American Journal of the Medical Sciences*.)

PNEUMONIA.

W. H. Wynn, M.D., F.R.C.P.

Sir Leonard Rogers¹ states that phthisis and pneumonia each were responsible for about one-sixth of the deaths in the Calcutta Medical College Hospital, each causing a higher mortality than any of the tropical diseases. A study of the deaths in the jail population of India affords ideal data for studying the incidence of pneumonia. It is shown that the highest death-rates from pneumonia occur in the north-west, the lowest rates being found in the south-east. The largest number of deaths occur in the four dry cold-weather months, and the lowest in the four warm, equable, rainy months. The north-west with the highest incidence has the most scanty rainfall, the lowest absolute humidity, the lowest cold weather minimum temperatures, the highest diurnal variations of temperature in the cold weather, and a prevalence of cold north winds. These facts are in accordance with the hypothesis that the onset of pneumonia is due to lowering of resistance by chills. The habit of the Indians washing in the cold early mornings in the open, clothed only in thin cotton dhoties or loin cloths which are allowed to dry on them, exposes them to chill. The low minimum temperature, remarkably wide diurnal variation of temperature, very dry atmosphere resulting in rapid cooling through evaporation, and the cold northerly winds found in the north-west divisions, with a pneumonic rate five to ten times that of the warm moist areas of the south and east, leave no reasonable doubt that chill is the most important exciting cause. It is interesting, however, to find that the case mortality is in inverse order, being lowest in the very dry cold areas and highest in the warm humid districts. A dry climate seems therefore to be favourable, and a humid one unfavourable, to the progress of the disease.

D. Brannan and E. W. Goodpasture² believe that in the bronchopneumonias of the great influenza epidemic the influenza bacillus was only a secondary invader associated with the unknown virus of influenza. The influenza bacillus, however, can produce a characteristic type of pneumonia, and the authors have studied five cases occurring during an interepidemic period. In four of the five cases there was an associated and perhaps prior infection with the pneumococcus; but in none was there a typical lobar pneumonia, and in one, notwithstanding invasion of the blood-stream by the pneumococcus, there was no localization in the lungs. The condition of the lungs in these cases was characteristic, and corresponded to the descriptions given by Pfeiffer in the epidemics of 1890-92. The gross appearance of the lung was that of grey peribronchial areas of consolidation, with semifluid pus within the bronchioles. These nodules were not hard and only slightly raised. They think this appearance can be relied upon in diagnosing an influenzal pneumonia. Smears from the pus showed large numbers of bacilli. There was a conspicuous absence of the wet, boggy, frothy condition seen during the epidemic, and also absence of cyanosis, interstitial emphysema, and necrosis of muscle. The absence also of a severe toxæmia suggested a complete etiological independence from the epidemic influenza. The lesion is essentially a bronchitis, ulcerative bronchiolitis, and bronchopneumonia, with a tendency to chronicity and to the formation of bronchiectatic abscesses. They consider the influenza bacillus to be one of the important secondary invaders of the lung, causing a bronchopneumonia which may terminate fatally.

TREATMENT.—A. I. G. McLaughlin³ used Type I Antipneumococcal Serum (Burroughs & Wellcome) in 27 cases of pneumonia (Series A) admitted to hospital during 1923 and 1924, and compares the results with the last 27 cases (Series B) admitted before the introduction of serum. The two series were practically identical as regards age and sex. In Series A there were 3 deaths and no cases of empyema. In Series B there were 7 deaths and 3 cases of

empyema. Virulent pneumococci were found in 24 cases: 14 Type I, 4 Type II, and 6 Type IV. No Type III pneumococci were found. After testing for sensitiveness to serum 50 to 100 c.c. of antipneumococcal serum were injected intravenously before the result of typing was known. When Type I was found, injections were repeated every eight hours until the temperature fell to normal and the pulse-rate dropped below 80. If other types were found, the injections were usually discontinued. The quantities injected ranged from 50 c.c. to 400 c.c. After each injection the temperature fell at least two degrees, and in some cases became normal or subnormal. Concurrently pulse-rate and respiration-rate were lowered. As the effect of the injection began to wear off, the pulse-rate increased, followed by a rise in temperature. Another injection of serum again caused a fall in temperature. In two cases admitted on the second day of the illness an intravenous injection of 100 c.c. in each case caused an instantaneous drop in the temperature with no secondary rises, and signs of consolidation did not develop. The usual 'plateau' type of temperature was not seen in serum-treated cases. An early crisis was usual when large quantities of serum were given at the outset, and with smaller doses a 'staircase' descent resulted. In all the patients who recovered, a serum reaction appeared, sometimes on the eighth day, more usually on the tenth, after injection. The reaction usually consisted of an urticarial rash, with joint pains in several cases, and in one slight hæmorrhage from the bowel.

W. W. Oliver and E. A. Stoller⁴ report the results of a clinical experiment with the subcutaneous administration of *Pneumococcus Antibody Solution* (Huntoon). Details of the method of preparation are given. In a series of 23 cases, only 4 gave evidence of subjective and objective improvement, and the remaining 19 did not appear to be benefited. It did not tend to sterilize the blood-stream, nor seem to prevent extension of the pneumonic process from one lobe to another. The best results were obtained in Type IV pneumonias, 10 in number, of whom 1 died, as compared with a mortality of 21.4 per cent in control cases. The authors consider that if these results were attributable to the antibody solution they were due to a non-specific action.

H. C. Berger and J. G. Montgomery⁵ have used *Chicken Serum* in the treatment of pneumonia. As a result of experiments on animals they find that there is present in the normal chicken serum a protective substance against the pneumococcus of Types I, II, and III. This substance is not an agglutinin. Agglutinating power can be produced in the blood and serum of chickens by intraperitoneal injection of living pneumococci, but without increasing the protective power of the serum. The chicken is tolerant of large doses of pneumococci intraperitoneally. The protective power of the serum becomes less with time, and finally inert. In a consecutive series of 63 cases of pneumonia in a children's hospital, 17 cases of bronchopneumonia and 24 of lobar pneumonia were treated with the blood or serum of chickens. Of these, 3 with bronchopneumonia died and 2 with lobar pneumonia died, the mortality being 12.2 per cent. During the same time 12 cases of bronchopneumonia and 10 of lobar pneumonia were admitted and received the usual treatment but without chicken serum. Of these, 7 with bronchopneumonia and 1 with lobar pneumonia died—a mortality of 36.3 per cent. The bronchopneumonia cases treated with serum on an average required 2.8 days for the temperature to become normal, and the lobar pneumonia cases 1.6 days, whereas the non-treated cases needed 11.0 and 9.4 days respectively. They conclude that in both bronchopneumonia and lobar pneumonia the mortality can be greatly reduced by the use of chicken serum, and also that the period of convalescence is much shortened. The protection afforded by the serum varies inversely with the time that has elapsed since the onset of infection and the administration of serum.

L. S. P. Davidson⁶ has studied the effect on the production of antibodies by various kinds of **Vaccine**. Vaccines were made from a Type I pneumococcus: (1) heat-killed vaccine, (2) detoxicated vaccine, (3) defatted vaccine. These were injected into rabbits, each receiving six doses at five-day intervals. After this the serum of the rabbits was injected into mice, together with a broth culture of the pneumococcus; in addition Rockefeller immune serum, normal serum, and culture alone without serum were used. The general conclusion was that, judged by the production of antibodies and protection to lethal doses of the organism, detoxicated and defatted vaccines had no immunological value comparable with that of ordinary heat-killed vaccines.

G. L. Waldbott⁷ points out that death in pneumonia is chiefly due to cardiovascular failure and anoxæmia. With acute circulatory failure it is useless to give **Digitalis** by the mouth; the digitalis group of drugs in such a case must be injected intravenously. The most powerful and rapid in action is **Strophanthin**. This is the drug for emergencies, but its use in extreme weakness must be guarded, as numerous deaths have been reported. He quotes Rahn, who advocates that it should not be given if any other of the digitalis group had previously been administered, if the pulse is bigeminal or irregular, or if there is nephritis. **Strychnine** is purely a central stimulant acting on the vasomotor centres, and **Caffeine** resembles it in its central action. On the heart itself it causes dilatation of the coronary arteries and increases the contractility of the muscle. **Camphor** in oil is slowly absorbed and soon inactivated. A water-soluble preparation has been introduced, and good results are said to be obtained by its intravenous administration. **Adrenalin** as a heart stimulant has long been given intramuscularly and intravenously. Its intracardial administration has more recently been advocated. The area on the left edge of the sternum in the fourth or fifth left interspace should be chosen. The stabbing of the heart forms the stimulus for an automatic ventricular contraction, and by this contraction adrenalin is brought into the ventricle and acts on the tertiary centres. As it is carried into the coronary circulation it restores the primary centres and thus the normal rhythm. As it is disintegrated in the blood-stream in a few minutes it has not a lasting effect, and further stimulation with strophanthin or caffeine is required. **Pituitrin** as a heart stimulant differs from adrenalin chiefly by its constricting effect on the coronary vessels. It is preferable where abdominal distention is present. Anoxæmia is due to different factors. When the dyspnœa is caused by paralysis of the respiratory centre, **Atropine** can be used with advantage. **Lobelia** is also of distinct value. Reflex dyspnœa from pleural pain requires sedatives. For anoxæmia due to extensive lung involvement or myocardial insufficiency, **Venesection** is advocated. The other chief measure for respiratory failure is the administration of **Oxygen**, and Waldbott uses Meltzer's method of insufflation.

F. M. Gardner-Medwin⁸ uses intramuscular injections of **Sodium Nucleinate** (ampoules of 2 c.c. containing 0.05 grm. in 1 c.c.) to stimulate leucocytosis, combined with $\frac{1}{2}$ -drachm doses of **Sodium Bicarbonate** every four hours, and glucose. In every case of lobar pneumonia a crisis occurred about forty-eight hours or so after the first dose of sodium nucleinate, no matter what day of disease it was administered. Cases of bronchopneumonia more often responded by crisis than lysis. Out of 53 cases, 8 died: 2 had bronchopneumonia, and the other 6 were war-worn soldiers in the pandemic period; 4 of these had nephritis, and all were in a very toxic condition on admission.

REFERENCES.—¹*Lancet*, 1925, i, 1173; ²*Arch. of Internal Med.* 1924, Dec., 739; ³*Lancet*, 1924, ii, 699; ⁴*Arch. of Internal Med.* 1925, Feb., 266; ⁵*Ibid.* 1924, Dec., 867; ⁶*Lancet*, 1924, ii, 1288; ⁷*Med. Jour. and Record*, 1924, Dec. 3, 536; ⁸*Brit. Med. Jour.* 1924, ii, 49.

POISONING.*Ivor J. Davies, M.D.*

Carbon Monoxide.—E. M. Vaughan¹ draws attention to the paralysing effect of carbon monoxide, and cites many instances in which it was obvious that the paralysing result of the gas was exerted before unconsciousness supervened. Not only is there great muscular weakness, but the trained mind also fails to act in an atmosphere containing carbon monoxide in excess. His examples readily explain why young adults are found unable to escape from fires through near points of exit. The cause of death in these types of accidents can be accounted for by the sudden paralysis of muscles, and it is not necessary to presume a homicidal attempt.

Mercuric Chloride.—J. M. McCants² reports a case of mercuric chloride poisoning beneficially treated by catharsis, egg-albumen, sodium bicarbonate, and calcium sulphide, 10 gr. intravenously. Experiments on rabbits have not proved calcium sulphide to be effective.

Oliensis,³ of Philadelphia, has treated 14 cases with only one fatal result, and he says that unless a primary gastro-enteritis causes a fatal termination no case is absolutely hopeless. The treatment adopted is the following: (1) Patient is put to bed. One quart of milk and the whites of three to four eggs are introduced into the stomach. Gastric lavage. (2) Potas. cit. 20 gr., sod. bicarb. 30 gr., t.i.d. (3) Fischer's solution, 6 oz., as retention enema twice daily. (4) Hot pack daily. (5) Soft diet, limit salt; no meat, no eggs; milk, 8 oz., every third hour. (6) Water in quantity sufficient only to satisfy thirst. (7) Magnesium sulphate every morning in dose sufficient to secure two stools daily.

Veronal.—Veronal has been the cause of many cases of poisoning since its discovery in 1903. W. H. Leake and E. R. Ware⁴ review 61 cases which have occurred in Los Angeles General Hospital in two years. A large number of the cases were addicted to the use of this or some other drug. Pollitzer sums up the symptoms as including the following: stupor, coma, mental confusion, excitement, vertigo, nausea, muscular weakness, inco-ordination, diplopia, thirst, oliguria, and a rash which may be erythematous, morbillous, or scarlatiniform, with vesiculation in the extremities, and rarely large bullæ. The characteristic spectrum of hæmatoporphyrin is quite regularly found in cases of veronal poisoning.

TREATMENT.—Leake and Ware recommend **Caffeine Sodium Benzoate** by hypodermic injection. They also advise the treatment outlined by Sands, namely, rapid elimination of the drug from every possible source—washing out the stomach, high colonic irrigation, frequent catheterization, and forcing of fluids. They report that one of their cases recovered after six days of coma.

Shoe Dye.—C. W. Muehlberger⁵ has collected the literature of 47 cases poisoned by shoe dye, containing either nitrobenzene or aniline. The prominent symptoms are cyanosis, vertigo, somnolence, headache, and digestive disturbances. He records cases that have been poisoned in which the feet of the victim were not even discoloured by the dye, indicating that the pigment had not reached the skin, although the solvent had been absorbed in quantities sufficient to cause definite cyanosis. Among other equally interesting cases Muehlberger records that of a student who, after wearing boots that had just been dyed, developed cyanosis within an hour. Four hours afterwards his body had become blue. The shoes were removed, and by the following morning cyanosis had completely disappeared. The dye used in this case contained aniline.

The only treatment advocated is that of rest in bed until cyanosis disappears. Oxygen therapy is not of benefit. He recommends prohibition of

the manufacture and sale of toxic shoe dyes, and the replacement of nitrobenzene and aniline by non-toxic solvents.

REFERENCES.—¹*Med. Jour. and Record*, 1924, Oct. 15, 379; ²*U.S. Naval Med. Bull.* 1924, May, 572 (abstr. in *Jour. Amer. Med. Assoc.* 1924, July); ³*Med. Jour. and Record*, 1924, Nov. 5, 427; ⁴*Jour. Amer. Med. Assoc.* 1925, Feb. 7, 434; ⁵*Ibid.* June 27, 1927.

POLIO-ENCEPHALITIS, ACUTE. (*See below.*)

POLIOMYELITIS, ACUTE. (*See also CENTRAL NERVOUS SYSTEM; JOINT SURGERY, RECONSTRUCTIVE; AND TENDON TRANSPLANTATION FOR PARALYSIS.*) *Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.*

Infantile paralysis, or acute anterior poliomyelitis, may occur sporadically or in epidemics. It is now universally recognized that the cause of the disease is a specific organism, and that this organism is one of the ultramicroscopic or filtrable viruses. Flexner and Noguchi have succeeded in cultivating such an organism and experimentally reproducing in monkeys the symptoms of the disease. The infection is probably most commonly introduced into the body through the nasopharyngeal mucosa. After an incubation period of a week or less, three stages of the disease are recognizable: the stage of onset, the stage of destruction of anterior horn cells, and the stage of repair.

The stage of onset is not always easy of recognition, especially in sporadic cases. Fever, malaise, sore throat, and perhaps gastro-intestinal disturbances, occur so commonly at the onset of other infective diseases, that we are often uncertain as to the presence of infantile paralysis until the paralytic stage has actually arrived, by which time a large part of the damage has already been done. In the presence of an epidemic, however, we may sometimes make a correct diagnosis in the pre-paralytic stage by noting the presence of pains in the back, and root-pains in the limbs, and by the occurrence of lymphocytosis of the cerebrospinal fluid, a sign which is proof positive of organic affection of the spinal meninges. If the disease is recognized in this pre-paralytic stage, **Serum Treatment**, administered both intravenously and intrathecally, together with **Urotropine** by the mouth, may abort the malady. The serum may either be that of a human patient who has previously suffered from infantile paralysis (and it seems probable that antibodies are present in such serum up to a period of five years after an attack); or we may administer the serum of monkeys who have been immunized by inoculations of emulsions of poliomyelitic nervous tissues, according to the method of Flexner and Lewis;¹ or we may employ normal horse-serum, which appears to contain antibodies against the virus. Rosenow² has prepared serum from horses immunized against his streptococcus,³ and has obtained encouraging results from its use. Clarke and Dow,⁴ of Omaha, have employed Rosenow's serum in 17 cases during a recent epidemic, and claim that, in every case where an early diagnosis was possible, complete recovery was obtained without residual paralysis. Whatever serum is used, its value is greatest during the pre-paralytic stage, but it is still probably of value even for the first two or three days after paralysis has appeared, when presumably the anterior cornual cells are in the stage of intoxication, and before actual degeneration has set in.

The value of **Urotropine** by the mouth has also been shown experimentally by Flexner and Clarke, who have found that the drug can be detected in appreciable amount in the cerebrospinal fluid, and that if, during this time, the monkeys are inoculated with the virus of acute poliomyelitis, paralysis can be delayed and even in some cases prevented. To obtain a therapeutic effect the urotropine should be given in large doses. Still has given as much

as 10 gr. every two hours for 24 doses in the case of a child of twenty-one months. Careful watch must be kept on the urine during the administration of such massive doses, lest signs of kidney irritation, evidenced by albumin or blood in the urine, appear. After the first forty-eight hours from the onset of paralysis, the stage of usefulness both of serum and of urotropine comes to an end.

During the last four years Bordier has treated patients in the acute stage of intoxication and oedema of the anterior horn cells by the daily application of X-rays to the affected region of the spinal cord, followed by systematic Diathermy to the muscles of the affected limbs. Bordier's methods of treatment were described by the reviewer in detail in last year's MEDICAL ANNUAL, and need not here be recapitulated. Bordier⁵ himself has replied to various criticisms of his method, and points out that to ensure the best results we must be careful to see that the X rays are accurately applied over the affected area of the spinal cord. Thus, for example, it is useless to radiate the sacro-lumbar region of the vertebral column when we should know that the spinal cord ends at the upper border of the 2nd lumbar vertebra, or to hope to influence the cervical enlargement unless we attack the vertebral column between the 3rd and 6th cervical vertebrae. Further, the X rays must be applied, not vertically through the overlapping and dense spinous processes, but obliquely, through the laminae. Bordier's further experiences have given highly encouraging results, not only in cases of a few days' duration, but even where treatment was commenced as late as four months after the onset of the disease, and where electrical reactions of degeneration were already present in certain of the muscles. In reply to his critics he stoutly maintains that the alleged danger to the spinal cord from X-ray applications is entirely hypothetical, and as a matter of fact has never been observed in clinical practice. He is also emphatic as to the value of radiotherapy, not merely in the acute febrile stage but for several months afterwards.

Lastly comes the stage of subsidence or repair, which may last for a couple of years, and thus comprises the great majority of cases of infantile paralysis met with in practice. What can be done for the patient in this phase of the malady? General hygienic measures, Massage to the wasted muscles, and the Prevention of Stretching of weakened muscles, together with Electrical Stimulation of muscles or parts of muscles which survive—such are the classical methods of treatment. Recently these have been supplemented by the use of systematic Diathermy, which restores heat to the cold and paralysed limbs, by Passive Movements to the joints of the affected limb, and by the encouragement of Active Movements as soon as these begin to reappear. It will sometimes be found that the earliest voluntary movements are first noticed when the patient is in a warm bath and the limb is partially floating, so that the weakened muscles do not have to work against the load imposed by gravity. Even in cases of many years' standing, Levick⁶ claims encouraging results by the use of Artificial Sunlight to the whole body, combined with diathermy to the muscles. The artificial sunlight is used for its general action in combating neurasthenia and rickets, both of which maladies are often associated with sunlight starvation. Re-education of recovering muscles, as Levick wisely reminds us, should be withheld until the proper time has arrived, i.e., when slight voluntary power has begun to reappear, and the child should not be discouraged by premature exhortations to try and contract muscles which are incapable of response.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1915, Aug. 15, 383; ²*Ibid.* 1921, Aug. 20, 588; ³*Jour. of Infect. Dis.* 1918, xxii, 281; ⁴*Jour. Amer. Med. Assoc.* 1924, Aug. 9, 421; ⁵*Presse méd.* 1925, June 17, 802; ⁶*Lancet*, 1925, ii, 323.

PRE- AND POST-OPERATIVE TREATMENT.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Prevention and Treatment of Post-operative Pulmonary Affections.—The *Lancet*¹ records an interesting discussion on this subject at the Royal Society of Medicine, where the importance of ether impurities was emphasized, and the use of gas-oxygen and novocain advocated. For facial, nasal, buccal, and pharyngeal operations, Dr. Shipway recommends intratracheal insufflation of ether. Bronchitis seldom occurred, and pneumonia never, in a number of cases of advanced years. Recent literature tends to indicate that there is a considerable increase in the risk of pneumonia or bronchitis in a patient who at the time of operation is suffering from an ordinary cold. Featherstone states that intratracheal insufflation of ether will not prevent the onset of every variety of pneumonia, nor will collapse of the lungs always be avoided, but the technique, if properly employed, will reduce the incidence of post-operative pneumonia.

During a discussion on anaesthetics from a surgeon's point of view,² the writer (W. I. de C. W.) referred to some of these points. He said that in connection with so-called ether bronchitis and ether pneumonia the anaesthetist had often no responsibility whatever. After certain abdominal operations, pulmonary complications might arise whether the anaesthetic was administered by rectum or any other method, and often followed the employment of local anaesthesia. In the acute upper abdomen the diaphragm becomes rigid by the same mechanism which causes rigidity of the recti muscles; there is a general reflex splinting of the whole area involved, and in consequence the diaphragm cannot descend. This fixidity of the diaphragm produces oedema of one or both lungs, and fine pulmonary crepitations can be heard at the base in most cases. These crepitations should not be mistaken for commencing pneumonia in the ordinary sense.

Wilkie thinks that crepitations at the base of the lung are an additional sign of acute infections of the biliary tract, but they have a far wider significance. If oedema of the lung is produced by the fixed diaphragm before operation, the condition is still more common after high abdominal operations. It must be within the knowledge of all surgeons of experience that high abdominal operations are very frequently followed by severe cough and expectoration for four or five days after operation, subsiding after relief of intra-abdominal tension by the first satisfactory evacuation of the bowels.

In 1916 a patient was seen with the signs and symptoms of an acute upper abdomen. On examination of the chest, crepitations were heard at the base of the right lung, and the physician in charge was of the opinion that pneumonia was developing, and that the abdominal symptoms were reflex and referred. In a short time the signs of an acute cholecystitis became unmistakable. About this time the late J. B. Murphy drew attention to the high mortality from oedema of the lung after closure of a large umbilical hernia, due, he said, to a deficiency in the action of the diaphragm muscle (the piston of respiration) in breathing; and since then fine crepitations have been frequently listened to at the base of the lungs on one or both sides before and after operations for the acute upper abdomen.

One of the last cases was one of the Ministers of the Irish Government, who was wounded in the back by a bullet. The spinal column was hit, and the bullet was deflected so that it came to lie above the right kidney in the region of the diaphragm. After the operation for extraction, fine crepitations could be heard at the base of both lungs; there was expectoration of rusty sputum, the temperature rose, and for a few days the condition of the patient gave rise to anxiety, but with the healing of the wound and gradual relaxation of the muscles the pulmonary complications, as is usual, disappeared.

It is therefore suggested that crepitations at the base of the lungs may be a sign in favour of an acute upper abdomen, and not against; that frequently crepitations are heard after high abdominal operations owing to rigidity of the diaphragm and recti muscles; that the tightening of the abdomen after the closure of a large ventral hernia may be followed by fatal pulmonary oedema; and that the condition—often referred to as ‘chestiness’ by the students and house-surgeons—after operations has nothing whatever to do with the anæsthetic.

H. Featherstone³ made an inquiry into the causation of post-operative pneumonia. After a lengthy and learned discourse, the following conclusions were arrived at: (1) Post-operative pneumonia occurs with grave frequency; (2) Often it is not recognized, and figures which purport to give its incidence are unreliable; (3) The anæsthetic agent and the method of administration, save in special cases, are seldom decisive factors; (4) Age and sex are not of importance; (5) General health and local disease of the lungs may play a considerable part; (6) At operation, every care should be taken to prevent loss of heat, of fluid, and of blood, and especially exhaustion from trauma to nerve tissue, and to highly vascular parts; (7) Infection of the lung is often by means of aspiration in the presence of certain other factors; (8) Severe sepsis in other regions affects the lung via the blood-stream; (9) There is evidence that lymphatic infection through the right half of the diaphragm leads first to pleurisy and then to pneumonia; (10) In the absence of severe sepsis, operations on the abdomen, and especially the upper abdomen, provide the start of the chain of events which leads to pneumonia; (11) Pain in the abdomen from operative trauma, or from inflammation, gives rise to rigidity of the anterior abdominal wall and to reflex inhibition of the diaphragm, together with some spasm of the lower intercostal muscles.

Morphia.—The use of morphia before and after operation is the subject of a communication by M. A. Slocum.⁴ Let it be said at once that morphia in conditions of extreme pain is usually essential and seldom contra-indicated. There are, however, various opinions in connection with its routine use before and after operations. It is seldom necessary to give morphia prior to operation, and its administration when deep relaxation is required is a disadvantage, and not an advantage. Breathing is slow and shallow, and the anæsthetist is in consequence working under difficulties when ether alone is employed. Apart from abdominal operations, however, the shock which follows primary amputation of a limb will be considerably reduced by an injection of morphia half an hour before. The reviewer believes that morphia administered as a routine after abdominal operations is a mistake—the patient on the third and fourth day often pays dearly for the immediate ease of pain and comparative comfort. Distention of the abdomen on the third day is more marked, the tendency to vomit more frequent, and the difficulty of obtaining bowel movements greatly intensified. Furthermore, if morphia is administered on more than two or three occasions after operation, the morale and the fighting power of the patient are considerably reduced. The great sedative and restorative action of morphia in cases of advanced peritonitis must not be lost sight of. There comes a stage in a dangerous case when the patient will no longer stand frequent gastric lavage, when enemata and aperients have been followed by unsatisfactory results. In such cases a rest following a hypodermic of morphia may be life-saving. Morphia can be given without hesitation in bad surgical cases when specially indicated, notwithstanding the presence of albuminuria; its administration may become equally necessary in cases of bronchitis or pneumonia following an anæsthetic. Children tolerate small doses well. Great judgement must be exercised in the use of the drug, and, in the opinion of the

writer, it should be avoided unless pain is pronounced or the patient is urgently in need of immediate rest.

From a questionnaire sent out by Slocum he concludes that: (1) The surgical profession is distinctly not in accord regarding the use of morphine before and after operations. (2) The reasons given, by surgeons in general, for not using morphine, differ widely. (3) It is a curious fact that one group of prominent men condemn morphine as definitely producing unfavourable symptoms, while another group advocate its use because it prevents these very symptoms. (4) This questionnaire clearly establishes the fact that a majority of surgeons are in favour of morphine pre-operatively and post-operatively in practically all cases. (5) At the present time there is less fear of using morphine in surgery than there was twenty years ago.

Surgical Shock.—D. Fisher and E. H. Mensing⁵ discuss the significance of acidosis and post-operative toxæmia. The lowering of the alkaline reserve, which, they state, in ether anaesthesia amounts to an average loss of 15 per cent, is mentioned, and the opinion is expressed that the routine treatment with glucose and alkalis is uncertain and unsatisfactory. It is a common practice to give patients large doses of **Glucose** and **Alkalis** both by mouth and by rectum for some days before operation, so as to anticipate a fall in the alkaline reserve as a result of operation, and to prevent, if possible, anything in the nature of acidosis.

It is difficult to gauge the benefits of this form of preparation for operation, and any statistics would be of no avail. It is generally believed, however, by those who use the method that post-operative shock, vomiting, and discomfort have been allayed to a considerable extent since its adoption as a routine. Starving and purging as a preliminary treatment to operation, of course, have been abandoned. After operation the patient is given much more freedom than heretofore. These considerations are almost as important as the diagnosis and operative technique.

Having regard to the connection between acidosis and shock, the body fluid must be preserved and the alkaline reserve maintained. Fisher and Mensing suggest an **Insulin-Glucose** treatment of surgical shock and non-diabetic acidosis. The treatment, they state, is practically specific in nature, is on a physiological basis, and consists in the intravenous injection of glucose and the subcutaneous injection of insulin. Since insulin causes such a rapid disappearance of diabetic acidosis, its action on non-diabetic acidosis was thought worthy of trial. This has been done by W. Thalheimer.⁶ The results obtained were more rapid and more certain than by the use of glucose alone.

Several cases are mentioned of pre-operative and post-operative acidosis. In one case 500 c.c. of a 10 per cent glucose solution was given intravenously, so that the entire time of administration consumed one hour and ten minutes. Soon after the glucose was started, 20 units of insulin were given hypodermically, and another 20 units at the end of administration. At the same time sodium bicarbonate was given rectally. Two hours after the glucose was given, vomiting ceased, and the acetone and diacetic acid were reduced from 3 plus to 1 plus. A second intravenous injection of 500 c.c. of glucose, and hypodermic injection of 15 units of insulin, cleared the acetone and diacetic acid from the urine. The writers of this paper indicate that insulin is the essential factor, and that glucose-insulin is much more efficacious and rapid than glucose alone. The combination of the two seems to be specific, whereas with glucose alone the results are uncertain. To give insulin alone is dangerous, because it must be assumed that there is present a sufficient available quantity of carbohydrate in the body, which is usually not the case in non-diabetic conditions.

Sir John O'Connor,⁷ in an article on the prevention and treatment of shock, draws attention to acute dilatation of the stomach and the early necessity of lavage. He urges immediate operation in a theatre with abundance of fresh air, on a table heated by electricity, with the patient's body wrapped in wool, and an electric cage heating the bed in anticipation. With regard to lung complications, he urges postponement if the patient has the slightest catarrhal cold, as ether anaesthesia is followed in such cases within forty-eight hours by pulmonary distress. Rightly he draws attention to the exposure of a patient on a cold operating-table slab.

Post-operative Pulmonary Embolism.—When writing the notes for the MEDICAL ANNUAL the reviewer lost a patient twelve days after a simple appendicectomy, from massive pulmonary embolism. There had been no rise of temperature, and the patient had no post-operative vomiting, and was playing bridge in bed with friends a few hours before the tragic occurrence. There was no warning, nor were there premonitory signs of any description. It is strange that pulmonary embolism seldom follows such operations as removal of cancer of the breast; these patients are often about fifty years of age; they frequently have a secondary anaemia; there is often a mild infection when the skin is sutured under tension, and large veins in the axilla are freely exposed and manipulated. Pulmonary embolism following goitre operations are also extremely rare. In the experience of the reviewer, the cases which die from massive pulmonary embolism are in private practice, and after operations which, *per se*, give no anxiety. It matters not whether the incision is below the umbilicus, in the middle line—the usual position for gynaecological operations—or through the rectus at any level. Entering the abdominal cavity is not, from the pulmonary embolism point of view, much more dangerous than an incision in the abdominal wall, such as is employed for the radical cure of hernia.

To analyse the causes and prevention of massive pulmonary embolism is like trying to analyse the riddle of the Sphinx. Such tragic accidents may be compared with the accidents which arise from street traffic; the pedestrian need not necessarily be lame in order to be killed, and it is Job's comfort to say that he should not have crossed the street. So it is in operative surgery. It may be that the growing tendency to allow patients out of bed on the second or third day after abdominal operations, and to move about freely, will lessen the incidence of pulmonary embolism, and it may be that patients nursed in private hospitals are kept too quiet and too long in bed after abdominal section; but the fact remains that it is in abdominal operations—intra- or extraperitoneal—that the catastrophe most often occurs. The reviewer has confirmed Lindsay's statement (*see below*) that it is common for a patient to ask for the bed-pan and fall back dying.

E. C. Lindsay⁸ says it appears that 40 per cent of cases of pleurisy and 12 per cent cases of pneumonia after operation are in reality cases of pulmonary embolism and infarction. The size of the embolism is the important factor: (a) The massive embolism occluding one or both pulmonary arteries; (b) The infarction type with severe onset followed by pleurisy and signs of consolidation; (c) The type where the site of the embolism is not recognized as an infarction; this type is associated with slight respiratory increase, a slight evening rise of temperature, and the bringing up of small collections of blood and mucus. The reviewer (W. I. de C. W.) also has noticed the evening rise of temperature which is a constant premonitory sign. Lindsay says of one patient that he had a sudden desire to defaecate, followed by the signs of embolism, and adds that this is a common premonitory sign.

Surgery is usually credited with the mortality which follows pulmonary

embolism; "but", says the writer of this paper, "lest it should be thought that surgery is mainly responsible for cases of pulmonary embolism, it is of interest to recall here the collateral figures which were published by Rupp from 13,000 autopsies over the same period of 18 years. He found that the mortality from pulmonary embolism in internal disease without operation worked out at 1.1 per cent—that is, four times as great as that following operation".

The principal factor in connection with pulmonary embolism is venous stasis such as is to be expected in pelvic operations in patients who have been suffering from hæmorrhage for a considerable time. Mild infarction seems to be a factor, but not the principal factor, in the production of embolism. Lindsay concludes as follows: (1) There is no evidence, from a consideration of statistics, that the condition has relatively increased. (2) Age is a most important factor in its production, the average age in the series being 52 years. (3) The primary thrombus formation occurs in the veins in which there is marked stasis—namely, the pelvic and femoral veins. In this series, in 42 per cent this thrombus was discovered. (4) Sepsis is probably only a contributory cause, acting by lowering the vitality of the patient, and therefore promoting stasis. Why thrombosis should occur in conditions of stasis in the aged, and not in the young, seems to me to be a problem for the physiologist rather than for the surgeon, and when that has been discovered we shall be nearer to a method of prevention of this complication.

REFERENCES.—¹*Lancet*, 1925, i, 333; ²*Brit. Med. Jour.* 1923, ii, 792; ³*Brit. Jour. Surg.* 1925, xii, Jan., 487; ⁴*Jour. Amer. Med. Assoc.* 1925, April 25, 1264; ⁵*Surg. Gynecol. and Obst.* 1925, April, 548; ⁶*Jour. Amer. Med. Assoc.* 1923, Aug. 4, 383; ⁷*Med. Press and Circ.* 1925, May 13; ⁸*Lancet*, 1925, i, 327.

PREGNANCY, DISORDERS OF.

W. E. Fothergill, M.D.

Recurrent Toxæmia.—F. S. Kellogg¹ is the author of a second contribution on a set of cases which he calls recurrent toxæmia of pregnancy. These are cases in which, in two or more pregnancies, symptoms of marked toxæmia develop, but in which it is impossible, between pregnancies, to make a diagnosis of chronic nephritis or kidney insufficiency. He considers that this is a clinical entity distinct from pregnancy complicating chronic nephritis, and different from the single acute toxæmia of pregnancy. He believes that about 14 per cent of women showing toxæmia in one pregnancy and not having chronic nephritis will tend to show such symptoms in another pregnancy. In about one-half of these the recurrence can be prevented by excessive prenatal care. Seventeen cases have been studied and recorded. If it can be shown that cases of this kind can be recognized and picked out for special care, a definite step in advance will have been made.

Eclampsia.—Several papers emphasize the advantages of conservative treatment of eclampsia over those involving active obstetric interference. This is an old story now, but as *accouchement forcé* continues to be used in some obstetric circles it is well that its bad results should be exposed from time to time. E. L. King² writes on the subject, and relies largely upon the use of *Morphia* and *Venesection* followed by lavage of the rectum and colon. He approves of the termination of pregnancy by bags after convulsions have ceased and the patient's condition has improved. E. Speidel³ concludes that the Rotunda method offers the best results at the present time. H. J. Slander,⁴ in a statistical study, advocates the use of a modification of the Stroganoff method, which he says has not been given a fair trial outside of Russia. Karl M. Wilson⁵ gives the results of cases of eclampsia treated in the Johns Hopkins Hospital, 1894 to 1924. In the first series the mortality was 25 per cent; in the second series it was 16 per cent, this improvement being due to the dropping of obstetrical interference, such as instrumental and manual dilatation of the

PLATE XLIX.

GENITAL PROLAPSE

(GIBBON FITZGIBBON)



Elongation of cervix following ventral fixation for prolapse.

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cervix followed by forceps or version. The writer finds that the results are twice as good under conservative as under radical treatment. Those cases do best which are subjected to a minimal amount of obstetric interference. At present the chief reliance is to be placed on free venesection, with morphia in moderate doses. Cæsarean section is to be discouraged. All this is very pleasing to those of us who have been teaching the same since the end of last century.

REFERENCES.—¹*Amer. Jour. Obst. and Gynecol.* 1925, Feb., 197; ²*Ibid.* March, 338; ³*Ibid.* 321; ⁴*Ibid.* 327; ⁵*Ibid.* Feb., 189.

PRESERVATIVES IN FOOD. (*See* FOOD, PRESERVATIVES IN.)

PROLAPSE, GENITAL.

W. E. Fothergill, M.D.

Elongation of the cervix following ventral fixation for prolapse is illustrated by Gibbon FitzGibbon.¹ The patient had had the fundus fixed to the abdominal wall some years ago; but the cervix was found to project about two inches outside the labia, while the fundus could be palpated in close contact with the abdominal wall just above the pubic symphysis. There was no cystocele or rectocele. The vaginal fornices were very low. The uterus was removed by vaginal hysterectomy after separating a dense fibrous band which attached the fundus to the abdominal wall. *Plate XLIX* shows the uterus with an inch rule alongside. The body is but little elongated. From the level of the internal os to the tip of the cervix the measurement is rather over four inches. Dr. FitzGibbon brings forward the case to show how the uterus will become elongated when the normal supports of the vaginal fornices are absent and when the body is prevented from following by being fixed above. Many specimens and cases of this kind have been shown and figured previously, but so long as people will go on doing abdominal operations for genital prolapse it is necessary to go on pointing out that these ventral fixations are futile and unnecessary. All the varieties of genital prolapse are constantly cured by plastic vaginal surgery, by methods which are suitable for parous women and also for those who have passed the menopause. Methods like interposition are quite unnecessary, yet surgeons continue to invent modifications and variations of this operation. The latest is one which leaves the cervix fastened down behind the urethra so that the os uteri is not much more than half an inch away from the urethral orifice. Truly it would seem that many an operator prefers a bad method of his own to a good one devised by any other person.

"Prolapse of the Cul-de-sac of Douglas" is the name given by L. E. Phaneuf² as an alternative for the more familiar 'posterior vaginal enterocele'. This is a very rare condition, and the writer has been fortunate in meeting with four cases of hernial sacs containing omentum and small intestine, descending through the floor of the pouch of Douglas between the rectum and the vagina. He has epitomized the literature of the subject, and describes a method of operating on the condition by the abdominal route, which he regards as preferable to the vaginal route in extreme cases and those complicated by adhesions.

REFERENCES.—¹*Jour. Obst. and Gynecol. Brit. Emp.* 1924, xxxi, No. 3, 412; ²*Amer. Jour. Obst. and Gynecol.* 1925, April, 507.

PROSTATE, SURGERY OF.

Sir John Thomson-Walker, F.R.C.S.

Prostatic Abscess.—L. Herman and J. Carp¹ discuss and describe 20 cases treated by perineal extra-urethral prostatectomy. In many cases not operated upon, spontaneous rupture of the abscess into the urethra is followed by prompt and apparently complete recovery. In the majority of such cases the abscesses have been situated close to the urethral mucosa. Only occasionally, if the abscess is primarily deeply placed, and very seldom after the pus

has penetrated the prostatic capsule and given rise to periprostatic suppuration, as was found in 35 per cent of the cases in this series, does spontaneous evacuation of the abscess occur via the urethra. In such instances there is apt to be a recurrence of symptoms after shorter or longer periods of apparent good health. On cysto-urethroscopic examination, one or more chronically infected cavities within one or both lobes of the prostate will be found communicating with the urethra, and these are responsible for the persistence of infection in many of the more aggravated forms of deep urethral infection. Mention is made of a series of 114 cases of prostatic abscess collected by Segond, of whom 34 died and 70 recovered, while the remaining 10 were left with a persistent fistula. Rupture of the abscess occurred in 102: into the urethra in 35, 28 of which ruptured spontaneously and 7 after the passage of a catheter; into the rectum alone in 18; into the urethra and rectum in 21; and into various other regions in 28.

Emphasis is laid on the importance of recognizing that the clinical picture may be indefinite, that localizing symptoms may be absent, and that in the treatment of distant foci of infection, associated with systemic symptoms grave and out of proportion to the degree of local disease, the possibility of metastatic prostatic abscess must be considered even in the entire absence of genito-urinary symptoms. A continued leucocytosis in spite of local treatment is of importance, especially in the differentiation between periprostatic and intraprostatic suppuration; but if the definition of the prostatic enlargement is replaced by general bogginess, or if it is possible to define a well circumscribed bulging of the rectal wall, an indication of extension of the suppuration to the periprostatic tissues is obtained.

The writers recommend prostatotomy by the perineal route, taking care to avoid the passage of any instrument per urethram for fear of rupturing the abscess into the urethra, with the attendant risk of fistula formation. A curved blunt instrument with its convexity towards the rectum is passed into each prostatic lobe, guided by a finger in the rectum; the opening is enlarged, all septa are broken down with the finger, as practically all these abscesses are multilocular, and drainage is instituted. The opening of these abscesses with the finger through an external urethrotomy wound is not recommended, owing to the tendency for unobliterated spaces in communication with the urethra to persist. Of the 20 cases treated by perineal prostatotomy, 18 were cured and 2 improved. In 3, post-operative complications necessitated further operation; one had severe bleeding into the bladder and epididymitis, another a fistula, and the third had severe hæmorrhage into the bladder, staphylococcal pyæmia, and lung abscess with secondary hæmorrhage from the lung necessitating blood transfusion. In cases, especially chronic ones, complicated by large periprostatic collections of pus, the writers advocate drainage of the bladder through an external urethrotomy wound in addition to the above-mentioned procedure.

Prostatic Obstruction.—In 20 cases, 15 of whom had been on catheter life for periods varying between 15 months and 6½ years, and all of whom were dealt with by suprapubic prostatectomy in two stages, N. Blaustein² found that two days before the first stage of the operation the average phenolsulphonaphthalein output for the first and second hours after administration was 38 per cent, the highest output being 47 per cent and the lowest 31 per cent. The average decrease in the amount of dye excreted eight days after the first stage of the operation was 19 per cent, the greatest being 20 per cent and the least 8 per cent. Two months after the second stage of the operation, however, the average improvement in the phenolsulphonaphthalein output was found to be 27 per cent, the greatest being 34 per cent and the least 22 per cent. The

average amount of residual urine present before operation was 22 oz., the greatest amount being 56 oz. and the smallest amount 11 oz., while the average blood-urea content was 41 mgrm. per cent, the highest being 58 and the lowest 19 mgrm. per cent. After the prostatectomy, 2 patients of the series developed asthma and bronchitis, one of whom died of hypostatic pneumonia five days after the second stage. One developed phlebitis in the right leg and recovered in three weeks. Recovery in the remainder was uneventful.

Davis³ advocates the use of *sacral anaesthesia* for prostatectomy performed by the perineal route, but finds that occasionally cases occur in which it is impossible to obtain a satisfactory anaesthesia by this method. He describes a 'haemostatic bag' which differs from the Hagner and Pilcher bags in that it is fitted with a large through-and-through stiff-walled tube for bladder drainage.

J. B. Hume⁴ describes the technique of suprapubic prostatectomy as carried out by Cabot, and states that, on admission to hospital, bladder drainage is instituted in all cases as a routine measure, either by means of an indwelling catheter or through a suprapubic wound, irrespective of there being urinary infection or a marked amount of residual urine or not. The reason for this is that it is considered that any degree of prostatic enlargement sufficient to produce symptoms will be associated with hypertrophy of the bladder muscle and thickening and congestion of the mucosa, the latter favouring the incidence of infection, and being relieved by a period of drainage.

N. P. Rathbun,⁵ in a paper on *seminal vesiculitis* as a complication of prostatism and prostatectomy, states that the occurrence of infection of the seminal vesicles as a cause of the persistence of symptoms after prostatectomy, such as marked frequency by day and by night, and a tendency to priapism, often, but not always, associated with epididymitis of variable severity, is a condition that has not received the attention it deserves. Further, in certain cases of apparent 'prostatism' it is the infection of the seminal vesicles which is the underlying cause of the symptoms, and, in such cases, adequate treatment by means of urethrovessical irrigations and prostatic and vesicular massage may prevent the performance of prostatectomy, which in such cases is likely to be of little value.

Carcinoma of the Prostate.—B. S. Barringer,⁶ discussing the use of Radium in the treatment of prostatic carcinoma, states that he applies the radium by means of needles introduced through the perineum in such a way that "the needles lie 1 to 2 cm. apart throughout the carcinomatous prostate, after which other needles are passed up into the seminal vesicles. The latter may be introduced through the rectum into the seminal vesicles, as the angle of introduction is often better through the rectum". Dosage varies with the size of the tumour, but at one time more than 800 millicurie hours are rarely given. For urethral invasion, screened radium (silver $\frac{1}{2}$ mm.) is used in the catheter for about 200 millicurie hours. Bare tubes of radium are not used in the prostate, as they cause undesirable sloughing and pain. This treatment is repeated every two or three months until in cases which react well, which unfortunately are all too rare, the prostate is a sclerosed mass. Young and Bumpus, on the other hand, give rectal and intra-urethral applications and intraprostatic treatment by needles to the extent of from 1900 to 4000 or even 5000 millicurie hours within a short period of weeks. The writers consider that their more gentle and occasional treatment is better, in view of the fact that the percentage of actual cures by radium or operation in this condition is so small, and that the patient, instead of having to go through a period of recovery from radium treatment as appears to be inevitable when the largest doses are given, is encouraged to get stronger and to exercise, and so stimulate

any powers of resistance that he may possess. Bone metastases were found in 27 per cent of the cases at the Memorial Hospital, New York, and the use of a diagnostic needle as a routine measure in suspected cases enables an accurate diagnosis to be obtained in a much larger percentage of early cases. Barringer considers that, in from 5 to 10 per cent of cases, the carcinoma ought to be controlled by the use of radium.

B. C. Corbus and V. J. O'Connor⁷ find that cancer of the prostate is stated to occur in from 15.5 per cent (Mayo Clinic) to 21 per cent (H. H. Young) of all cases of obstruction at the neck of the bladder, and they quote Lowsley as stating that the condition most commonly begins in the so-called 'posterior lobe', spreads upwards beneath the trigone and along the seminal vesicles by direct extension, but remains limited for a relatively long time by the various fasciae which go to form the prostatic fibrous sheath. The mucous membranes of the urethra and bladder also show definite resistance to invasion, and the constriction in the prostatic urethra so often met with during examination is due primarily, for a time at any rate, to what the writers term "pressure of the growth within the limits of the mucous membrane and sheath" rather than to actual invasion of the mucous membrane and bladder. The condition is of slow growth in a majority of cases, and remains confined, it may be for several years, within the fascial and mucosal limits mentioned. The peri-prostatic structures are involved late, and intravesical extension occurs in only a small percentage of cases, and then, as a rule, late in the disease. Having these points in mind, the writers advocate Fulguration of the carcinomatous prostate exposed by the perineal route in selected cases. For cases with evidence of impairment of the renal function, preliminary suprapubic cystotomy is performed, and, if simple hypertrophy is associated with the malignant change, the latter is treated before any attempt is made to deal with the benign enlargement. During exposure of the prostate through the perineum, the prostatic retractor is passed through the whole length of the urethra in order to avoid cutting the urethra. The inactive electrode, well moistened with hypertonic saline, is placed over the symphysis pubis; and the active electrode, fitted with a flat metal disc, 0.5 cm. in diameter, after removal of a portion of the fully exposed prostate for purposes of examination, is applied to the prostate in such a way as to coagulate the whole available surface, and by strong retraction, to some extent, the vesicles also. After this a needle electrode is substituted for the disc, and, with a finger in the rectum as a guide, a still deeper application can be made by pushing the needle electrode into the vesicle, care being taken not to damage the rectal wall. The coagulation of the 'posterior lobe' should be done slowly and carefully, sponges moistened with hypertonic saline being placed immediately around the area to be dealt with in order to safeguard the rectal wall. If there is no complicating benign hypertrophy of the prostate, the bladder is drained by a catheter brought out through the membranous urethra; but if this condition is present, suprapubic drainage is instituted, and some months later, if X-ray and other examinations show no evidence of metastasis, and if there is no sign of recurrence locally, removal of the adenomatous tissue is carried out.

When the sclerosis which follows electro-coagulation gives rise, as it frequently does, to contracture of the neck of the bladder, the authors cauterize the internal urinary meatus through a suprapubic cystotomy wound, and then slowly coagulate the remaining portions of the obstructing lobes, and subsequently carry out the regular passage of urethral sounds.

REFERENCES.—¹*Ann. of Surg.* 1925, June, 1115; ²*Med. Jour. and Record*, 1925, June 17, 738; ³*Jour. Amer. Med. Assoc.* 1924, Dec. 20, 1988; ⁴*Lancet*, 1925, i, 983; ⁵*Surg. Gynecol. and Obst.* 1925, Feb., 214; ⁶*Ann. of Surg.* 1924, Dec., 881; ⁷*Surg. Gynecol. and Obst.* 1924, Dec., 818.

PRURITUS ANI.

J. P. Lockhart-Mummery, F.R.C.S.

Louis Savatard discusses the treatment of this condition from the medical point of view. He insists on the importance of careful examination, as a local cause for the irritation can be found in the great majority of cases. He ranks **Carbolic Acid** as of the first importance as a local application (1-80 as a lotion) or as a liniment (1-20 of olive oil). He recommends the following prescriptions :

R	Acid. Carbol.	gr. xv	Paraffin. Moll.	ad ʒj
	Cocainæ Hydrochlor.	gr. x		
R	Acid. Carbol.	gr. xv	Ol. Lini	ʒj
	Hydrarg. Perchlor.	gr. ij	Paraffin. Moll.	ad ʒj

Another useful preparation is—

R	Acid. Salicyl.	gr. xv	Paraffin. Moll.	
	Liq. Picis Carb.	℥xx	Adipis Lanæ Hydr.	āā ʒss
	Hydrarg. Ammon.	gr. xv		

He mentions **X-ray Applications**, but warns against the danger of over-exposure to the rays. He does not mention the danger of sterilization which may result, and cannot easily be guarded against in women.

The results of X-ray treatment in bad cases of pruritus ani have on the whole proved very unsatisfactory, and even in skilled hands the treatment has too frequently resulted in burns of a serious nature. **Ball's Operation** has given such good results that it is not advisable to subject patients to the dangers of X-ray treatment.¹

The cases of pruritus ani which present the greatest difficulty are those with a history of severe itching dating back for several years. Removal of the local lesion, even if present, seldom stops the itching, and they generally have a history of having tried innumerable remedies, none of which have given relief for more than a short time. We must conclude that, if pruritus ani has existed in at all an aggravated form for a long time, definite changes have taken place in the deeper layers of the skin, probably as a result of the constant scratching. These changes are probably in the nature of fibrosis involving the delicate nerve-endings, and they become more or less permanently affected so as to act as a bar to effective treatment. In fact, in these old-standing cases actual disease in the condition of the nerve-endings exists. This was first realized by the late Sir Charles Ball, who pointed out that a definite nerve lesion was the underlying cause in these severe cases. It is understandable, if such changes have occurred, that it is not likely that local applications can be of any serious value; nothing short of destruction of the diseased nerve-endings is likely to put a stop to the irritation. This was more or less recognized in the old days, when such cases were treated by excision of the anal skin, or drastic application of the actual cautery, as it was then found that only complete destruction of the skin cured the condition. Unfortunately results of such operations were bad owing to the very severe scarring which necessarily resulted. No such drastic measures are now necessary. The operation originally described by the late Sir Charles Ball has now been performed at St. Mark's Hospital for just twenty years, and considerable experience of the results has been obtained. The principle of the operation is to divide all the nerve-endings passing to the skin which is involved in the itching, the nerves being divided immediately beneath the skin. The immediate effect of the operation is to produce total anaesthesia in the whole of this area of skin, and unless the operation achieves this it is of no use. In the course of about four to six weeks the sensation returns completely, but there is no recurrence of the pruritus. This seems to prove Sir Charles Ball's contention that disease of

the nerve-endings exists, and that when new nerve-endings have grown into the skin the pruritus ani does not recur.

The operation is not a particularly easy one, and will certainly fail if total anaesthesia is not obtained. Considerably over a hundred cases of this operation have been recorded at St. Mark's without any complications of a serious nature. No instance of sloughing of the flaps has occurred, and the results have been universally satisfactory. A few cases recurred after a considerable interval. Most of these were easily cured by suitable applications, and in a few the operation has been repeated with success. Failures are probably due to the original operation not being freely enough performed.

The following is a description of the operation: The skin having been cleansed as completely as possible and shaved, a curved incision is made on each side of the affected area, enclosing the entire ellipse with the exception of a narrow neck in front and behind; the flaps are raised by careful dissection with a knife or scissors from the subcutaneous tissues round the anal margin, and up the anal canal, keeping inside the sphincter muscle, to above the mucocutaneous junction, the dissection extending round the entire circumference, and all connections with the subjacent tissues being divided. The pedicles in front and behind are now undercut to a point well beyond the area of irritation, and the outer concave edges of the incision also undercut to a distance of at least $\frac{1}{4}$ in. free of the involved skin all round. Care must be taken to stop all bleeding, and the flaps should not be replaced until it is completely arrested, as the formation of a hæmatoma in the wound might compromise the vitality of the flaps. The flaps are finally replaced and retained by sutures, a few intervals being left between them for drainage. The immediate result of this operation is to render the entire ellipse between the incisions, the pedicles, and outer edges, as far as they have been undercut, superficially anaesthetic, and the itching is at once relieved.

As an alternative to the incision described above, some surgeons make four or more radial incisions, and undercut the skin between in the same way. Personally, the author prefers Ball's original incisions, as the line of suture is thus kept farther from the anus, and is consequently less easily infected. Moreover, one can make a more thorough dissection and be more certain of dividing all the nerves both to the anal skin and to the anal canal.

Special Points in Performing Ball's Operation.—(1) The resection must be taken up well inside the external sphincter, or all the nerves will not be divided. (2) Great care must be taken to keep inside the external sphincter, as otherwise this muscle, or its nerve-supply, may easily be damaged. (3) It is necessary to be very careful not to buttonhole the flaps, or a fistula will probably result. (4) Bleeding should as far as possible be stopped by twisting the vessels, so as not to leave a lot of catgut in the wound. (5) Good drainage must be provided for twenty-four hours, and the flaps kept firmly pressed down by suitable dressings and bandages. The success of the operation depends upon obtaining total anaesthesia of the whole of the pruritic area. If, after the operation, this is found not to be present, failure is to be expected.

REFERENCES.—*Lancet*, 1924, ii, 924.

PSORIASIS.

E. Graham Little, M.P., M.D., F.R.C.P.

J. F. Schamberg¹ attempts to "separate conjecture from fact" in our views of psoriasis. For this purpose he analyses 592 cases which have passed under his care, and some points of interest emerge; 281 were males, 244 females; 67 per cent began between the ages of 11 and 30; in 87 per cent there was no other member of the family affected; as has been frequently noted, the disease is extremely rare in the coloured races—Schamberg has never seen it

in the negro. Of these cases, 93 per cent were free from any symptoms of rheumatism, to which psoriasis has been sometimes ascribed. Its connection with gout—an equally popular belief—is disproved by researches carried out by Schamberg and Raiziss, who show there was no disturbance of uric-acid metabolism in patients suffering from psoriasis. Innumerable efforts to find a parasite as the cause have failed.

TREATMENT.—The author's chief contribution to an improvement in treatment is the suggestion that the patient should be kept upon a **Low Protein Diet**. This should be very carefully prescribed, and the prescription enforced on the patient. "If one places a psoriasis patient, for a number of weeks, on a diet containing about $\frac{1}{4}$ gm. of nitrogen a day, without other treatment, one will observe, particularly in extensive eruptions, an astonishing involution. Per contra, a diet of 20 gm. of nitrogen a day will tend to aggravate an existing eruption". Under the category of inducing **Foreign Protein Reaction** the author includes the intravenous injection of vegetable products, such as an extract of alfalfa seed; the injection of a vaccine, containing chiefly fecal streptococcus and colon bacillus, advocated by Danyasz; the subcutaneous or intravenous injection of typhoid or colon bacillus; and, finally, autoserum injections. The author considers the most useful of these is the autoserum procedure (see MEDICAL ANNUAL, 1915, p. 544; 1917, p. 470).

Cranston Low² considers treatment under two heads, external and internal.

External.—In acute spreading cases bed is essential, and all strong applications must be avoided. **Sulphur Baths** are often beneficial. Plain **Vaseline** may be rubbed into the skin night and morning. After some ten days, when the acute eruption has subsided, the following ointment may be given:—

R Sulph. Præcip.	Lanolini	
Acidi Salicyli.	Vasolini	
		ss 3 ss

When improvement with this is at a standstill, the strength of the salicylic acid and sulphur may be increased up to 1 and even 2 per cent. Then **Crude Coal Tar** may be painted on very thinly with a stiff brush, on a small area at first to test its reaction; if no irritation is experienced, larger areas may be tried, and tar applied every five days, and then every three days, two days, and finally every day. The author thinks that cases treated with crude tar are less liable to relapse than with any other method. Chrysarobin he uses only in cases which can be kept in bed, and he advises tar after the eruption has been cleared by chrysarobin. X rays are only applicable to stubborn cases, and the warning is given that relapse is especially common after this treatment.

Internal.—For internal treatment the author gives arsenic only in stationary cases, and does not exceed a dose of 5 min. of liq. Fowleri ter die. The newer arsenical preparations of arsenobenzol have proved disappointing in psoriasis. **Salicin** is preferred to arsenic by the author in spreading and chronic cases. On the analogy of the seborrhœoids it may be that there is a certain degree of hyperacidity in psoriasis, and this acidity is possibly due to bowel infection. Dieting should be tried, cutting out individual items and noting the result, which is usually apparent within ten days, the groups of foodstuffs to be thus tried out being sugars, starches, fats, meats, and acid fruits. Plombières douches are often especially useful. Vaccines have been disappointing. The author recommends the use of protein therapy when all other methods have failed, and he prefers the **Injection of Sterilized Milk** to other means. Ordinary fresh cows' milk is given, as fresh as possible. It is heated in a water-bath arrangement, the surrounding water being boiled for fifteen minutes. For adults the first dose, given intramuscularly, is 2.5 c.c., then 5 c.c., then 7.5 c.c.,

then three doses of 10 c.c. at intervals of twice a week. Six injections should suffice, and local treatment must be continued throughout. For children the doses of milk should be 1 c.c., 2 c.c., 3 c.c., and 5 c.c. The warning is emphasized that alcohol in any form must be avoided.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, ii, 1211; ²*Lancet*, 1924, ii, 334.

PUERPERAL PELVIC INFECTION.

W. E. Fothergill, M.D.

In the MEDICAL ANNUAL for 1924,¹ the writer called attention to the published reports of the large maternity hospitals in this country where records are kept of morbidity as well as of mortality. 'Morbidity' is a term which includes all febrile disturbances during the lying-in time. After excluding all cases in which the fever is due to ascertainable causes other than pelvic infection, the remainder of the 'morbid' cases are regarded as examples of puerperal pelvic infection. Thus the study of these reports gives us an idea of the incidence of puerperal pelvic infection. The mortality from this cause is also plainly stated in the reports. This is the only method of any value by which we can estimate the incidence and fatality, and it shows that infection occurred in about 8 cases out of every 100 deliveries dealt with in a long series of reports. In another series the figure was lower, namely 6 per cent. One death occurred in every 25 to 30 cases of infection. Thus in 1000 confinements some 100 cases of puerperal pelvic infection, some trifling, many serious, and about three fatal, may be expected in the practice of hospitals in large English towns. In some regions the resistance of patients to infection is higher than in others. FitzGibbon² gives figures from Dublin dealing with 14,380 women delivered, some in their own homes, and some in the hospital. The general mortality from sepsis was 1.5 per thousand, and the mortality within the hospital 1.1 per thousand. J. Whitridge Williams,³ of Baltimore, mentions 3000 cases with 8 deaths. F. S. Taylor-Thomas⁴ mentions that in Western Australia the mortality from puerperal sepsis was a little below 1 per 1000 in 1922 and a little over this rate in 1923.

In May, 1924,⁴ the present writer published a clinical lecture on this subject in which he reiterated the old objections to the use of the term 'puerperal fever' except in historical writings, and once again directed attention to the farce of notification which has been going on since the year 1898 without any apparent benefit to patient or public. It was also pointed out once more that the fever hospital is not the proper place for the treatment of puerperal pelvic infection, but that this should be conducted in hospitals for the diseases peculiar to women by men who are familiar with pelvic surgery. Soon after this lecture was published, i.e., in May, 1924, Sir George Newman⁵ wrote to the Section of Obstetrics and Gynaecology of the Royal Society of Medicine asking for observations from the Society as to the terminology and definition of puerperal fever, and as to suitable administrative action which might be taken. The Council referred the matter to a committee, which reported as follows:—

1. "Any case in which there is a rigor or a temperature of 102° or higher for twenty-four hours during the first ten days after a confinement or abortion must be notified."

2. "Get rid of the term 'puerperal fever' and use in its place the term 'puerperal sepsis'."

3. "Puerperal sepsis is a febrile condition of the nature of wound infection arising after labour or abortion, due to bacterial invasion from, or absorption of products of bacterial action from, some portion of the genital tract."

The above report was discussed at a meeting of the combined Sections of Obstetrics, Epidemiology, and State Medicine and the Society of Medical Officers of Health in November, 1924. Dr. J. S. Fairbairn thought that notification

might be made to include 'suspicious cases' as well as those definitely diagnosed as puerperal pelvic infection, with the object of special investigation and treatment and measures to limit conveyance of infection. But was the notification of all suspicious cases possible, and, if it were, would it make much impression on the incidence of the disease? "Casting the net widely would certainly make the life of the practitioner who does much midwifery so much more of a nightmare than it now is, that only the most thick-skinned would survive". Dr. Fairbairn asked if it were not possible to organize some help for practitioners available upon voluntary notification: obstetric consultations, bacteriological examinations, domiciliary nursing, and, if possible, a certain amount of hospital accommodation both for observation and for nursing and treatment. These things being provided, practitioners could be informed and asked to notify voluntarily all cases of fever in childbed. Dr. T. W. Eden thought it was a mistake to approach the subject from the aspect of notification. At the earliest stage the whole field of puerperal morbidity must be brought into view. Liberal state assistance would, of course, be required. Some form of national midwifery service was essential. Dr. C. E. S. Fleming thought notification was useless if there was nowhere to send the patients. The isolation hospital was now the only place; but it was essential that someone should be there capable of looking after them. Dr. Harold Scurfield noted that all speakers had agreed that notification had been a failure. He agreed on the importance of working out a scheme for dealing with cases before the details of notification were discussed. Sir Ewen Maclean said that notification brought no help to the patient. If it became known that notification resulted in benefits, prejudice would soon be swept away.

The fifth British Congress of Obstetrics and Gynaecology² met in April, 1925, and devoted some time to this subject. A committee of the Obstetric Section of the Royal Society of Medicine reported after collective investigation upon 249 cases in which blood infection was assumed to have occurred on account of (1) isolation of the organism by blood culture, (2) prolonged pyrexia, (3) repeated rigors, (4) pyæmia, including septic pneumonia, (5) death of the patient. Death occurred in 89 of the 249 cases (35 per cent), which clearly were severe in character. They are analysed at length, and the report should be read *in extenso*. A Committee of the North of England Obstetrical and Gynaecological Society reported upon 154 cases selected upon the same criteria and showing a mortality of 76 per cent. This report is also of great interest, but does not lend itself to abstraction.

Gibbon FitzGibbon and J. W. Bigger² contributed a clinical and bacteriological investigation from the Rotunda Hospital, Dublin, on 57 cases which had a mortality of 51 per cent. These cases are named by the writers 'acute puerperal infection', but the meaning of this term is not made clear. It is stated "that acute puerperal infection is due to the introduction of an exogenous hæmolytic streptococcus into the uterus; that the prognosis is good if the infection remains local; but there is a marked tendency for it to extend and cause a blood or peritonitic infection with a mortality of at least 75 per cent; that non-hæmolytic streptococcal infection of the uterus is not commonly a primary cause of serious puerperal infection, and when found during the puerperium associated with blood infection is probably an exhibition of an extragenital and often antepartum general infection". In contrast with the above-mentioned 57 cases, the writers investigated 22 other cases which all recovered, and only one of which gave a streptococcus, a non-hæmolytic one. They consider that *Staphylococcus aureus*, *Bacillus coli*, and gonococci are likely to produce local infections which do not tend to become general. In conjunction with this paper the writers have carried out an investigation

on normal puerperal patients, showing that non-hæmolytic streptococci are present in the puerperal vagina in 80 per cent of normal cases, and in the uterus in 25 per cent. Hæmolytic streptococci were found twice in the examination of 108 vaginal swabs. *Streptococcus pyogenes* was never found.

In the discussion on these reports, Professor J. Whitridge Williams,² of Baltimore, remarked that the high mortality showed that many cases are hopeless *ab initio*. "What we should realize is that there are two types of cases, one which will get well if you leave it alone, and the other which will die whatever you do. It is important to recognize the type which will die no matter what you do for her, and the type which will recover if we do not help to kill her". Whitridge Williams gave interesting figures from his own service. Amongst 3000 cases there were 436 cases of rise of temperature in which the possibility of uterine infection had to be considered. There were 23 in which the cultures were sterile, leaving 353 puerperal infections in 3000 cases, namely 11½ per cent. There were 3 deaths in the 353 cases, a fatality of 0.86 per cent. Hæmolytic streptococci were found in 32 cases, non-hæmolytic streptococci in 34 cases, the organisms found in the other cases being colon bacilli, gonococci, staphylococci, and saprophytes. The speaker said: "We do not treat these women locally; we do not do anything to them except feed them well and give them fresh air. That is to say, unless there is pus locally, and then we go after it and remove it". "A certain number of women are foredoomed to death as soon as infection occurs, because we are here dealing with women of little resistance, and the outcome is the same whether we look at her, pray for her, or give her any drug we like".

At this conference the following resolution was carried unanimously: "In the opinion of the British Congress of Obstetrics and Gynecology, the most urgent requirement in connection with the problem of sepsis is the provision of adequate accommodation for the reception and treatment of these cases in hospitals supervised wherever possible by obstetric surgeons".

The present tendency appears to be towards notification of all cases of fever during the puerperium—'puerperal morbidity', in short—the investigation of the case and the diagnosis being made after notification instead of before it. If this policy were carried to its logical conclusion, there would be 70,000 to 80,000 notifications every year in England and Wales, with subsequent inspections and investigations by officials, and removals to hospitals of certain patients. The question remains, Would this save any lives? In 1920 there were 957,782 births registered, and 2087 deaths from puerperal pelvic infection. The object of everyone is to reduce this mortality. But is it possible to do this by any legislation or administrative measure in the present state of society? Will not time be needed for the evolution of personal hygiene, of housing and sanitation, of the practice of midwifery, and of scientific knowledge of puerperal pelvic infection? The perusal of the recent literature of the subject leaves the impression that we know nothing more now than some of us have known for many years; except perhaps that the majority of the bad cases are due to the action of hæmolytic streptococci. In the words of Dr. Whitridge Williams, "If you have a virulent organism and a non-resistant woman, death is the almost universal outcome, no matter what you do, and there is no use in deceiving ourselves and using sixty remedies for such cases, as are mentioned in the London report". In other words, none of the new treatments has been proved to afford any special advantage.

It seems probable that, in order to reduce the effects of puerperal pelvic infection, we must first secure that there shall be fewer non-resistant women in the population—civilization, in short, must march onward. Next, nothing is better known than that infection is common in abnormal cases which require

operative interference and instrumental delivery. Thus hospital accommodation and skilled obstetricians must be supplied for the abnormal cases. Here again it must be remembered that in hospital small epidemics are bound to occur from time to time when a virulent organism is imported and spreads by contagion before its presence, much less its origin, can be discovered. Therefore we should think twice before advising the unlimited extension of hospital accommodation for normal midwifery. The normal patient is really safer in her own home than anywhere else, if she can be properly attended.

REFERENCES.—¹*Med. Ann.* 1924, 376; ²*Jour. Obst. and Gynecol. Brit. Emp.* 1925, xxxii, No. 2, 201; ³*Med. Jour. Australia*, 1924, July 5, 5; ⁴*Brit. Med. Jour.* 1924, May 3; ⁵*Lancet*, 1924, ii, 1011.

PULMONARY TUBERCULOSIS. (See TUBERCULOSIS, PULMONARY.)

PULSUS ALTERNANS. (See HEART, ARRHYTHMIA OF.)

PURPURA (following Injection of Neoarsphenamin).

E. Graham Little, M.P., M.D., F.R.C.P.

The case here detailed by Morton Smith¹ is of particular interest, as it concerned a patient a man, age 44, who had apparently been reinoculated with syphilis after a cure of a previous syphilis by neoarsphenamin, a year previously. In the second series of injections (0.9 gm. given weekly), the third injection was followed within a few hours by faintness and bleeding from the nose and gums. This cleared up within a few days, and the patient was given his fourth injection a week later. Profound collapse followed immediately, but he recovered within an hour and went home, and was there found to have severe bleeding from nose, gums, and rectum, and extensive purpura. There was no jaundice. The author emphasizes the serious symptom which purpura constitutes in arsenical injections, and deprecates the giving in this case of the fourth injection after the plain warning conveyed by the third.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1925, Feb., 237.

PYLORIC STENOSIS OF INFANTS.

Reginald Miller, M.D., F.R.C.P.

TREATMENT.—L. G. Parsons¹ compares the treatment of this condition by Rammstedt's Operation with the medical treatment by means of thick cereal feeding or by the atropine method. He unhesitatingly decides in favour of the operation, as have most recent writers. The results of this procedure are found on practically all hands to be greatly superior to any form of medical treatment. In the present author's cases, taking both hospital and private cases together, his death-rate in pyloric stenosis has fallen from 88 to 46 per cent. In a series of cases treated in 1923, 18 cases, the recovery-rate was just over 70 per cent. Poynton, Higgins, and Byrdson have reported 73 per cent of recoveries in a series of 57 cases. With, then, this particular form of treatment so satisfactorily established as the operation of choice, it is of importance that the pre- and post-operative procedures should be well understood. Most observers will have met with cases which, although apparently moribund at the time of operation, have been saved, so that it may be said that no case is too bad to attempt to save by immediate operation; but whether immediate operation is the correct treatment for all cases is not so settled. Parsons states, and the present reviewer would side with him in this, that if there is no great urgency it is good practice to wash the stomach out for one or two days before operation, as tending to remove the mucus in the stomach and thus lessen post-operative vomiting. For the same reason he prefers gas and oxygen for the anæsthetic. Post-operative hyperpyrexia is also lessened by the use of the same anæsthetic mixture, but more particularly by the administration

of rectal salines after the operation and the avoidance of hypertonic salines under the skin before the operation. The probable cause of the pyrexia is dehydration (inanition fever), which will be increased by the employment of hypertonic solutions. The diarrhœa which may follow the removal of the pyloric obstruction is due to the atrophy of the intestine, and thus, until the intestine is re-educated to deal with larger feeds, only very small amounts should be given at a time.

H. Ashby and A. Southam² discuss the same subject, and again express a very decided opinion in favour of operation by the Rammstedt method. They have obtained a death-rate as low as approximately 30 per cent. They seem to prefer immediate operation in every case, and are keen to preserve breastfeeding for the infant if possible throughout. For the anæsthetic they prefer warmed ether to gas and oxygen.

REFERENCES.—¹*Clinical Jour.* 1925, 199; ²*Brit. Med. Jour.* 1925, ii, 403.

PYREXIA, OBSCURE.

Ivor J. Davies, M.D.

Adam Patrick¹ contributes a practical article on the diagnosis of obscure pyrexias. A more elastic service should be given by the public health laboratories. The pathologist or an assistant should be available for such examinations as a leucocyte count which may indicate an obscure source of sepsis, or to perform a blood culture in a suspected case of septicæmia, or again lumbar puncture in meningitis. The present position is somewhat anomalous; it permits of the examination of blood serum only, e.g., in the diagnosis of the now relatively rare enteric group of infections, whilst blood culture, so essential in the early diagnosis of septicæmia due to the common pyrogenic organisms, or again the estimation of blood sugar or blood urea, is not a part of the routine work of most of the public laboratories. It may be difficult for a pathologist to leave the laboratory, but a skilled assistant could undertake such work as a leucocyte count, or the collection of blood for culture or chemical examination.

Professor Patrick discusses the subject on the following lines: (1) The types of disease which commonly produce pyrexia; (2) The commoner methods of examination other than the ordinary routine clinical examination.

1. The list of diseases, mostly of bacterial origin, is grouped as follows:—

In the lungs	..	..	{	Lobar pneumonia Bronchopneumonia Tuberculosis Influenza Pleurisy and empyema
In the heart	..	..	..	Malignant endocarditis
In the stomach	..	..	..	Cancer
In the intestine	..	..	{	The typhoid group Appendicitis The dysenteries
In the liver	..	..	{	Amœbiasis Suppurations about the gall-bladder Syphilis Subdiaphragmatic abscess
In the genito-urinary tract			{	Pyelitis Perirenal abscess Abscess of the prostate
In the brain	..	..	{	Abscess Meningitis
In general	..	..	{	Acute leukemia Malaria Various septicæmias (streptococcal, meningococcal, gonococcal, staphylococcal) Acute rheumatism

2. Under methods of examination he mentions :—

- Counting of leucocytes, and, if necessary, a differential leucocyte count
- Examination of a blood-film for malarial parasites
- Blood culture
- Widal reaction
- Wassermann reaction
- Microscopic examination of the urine for pus
- Lumbar puncture
- Ophthalmoscopic examination

In the clinical examination is emphasized the importance of a thorough search for an accessible source of sepsis, as, e.g., the nasal cavity, or for enlargement of the spleen.

Under other methods of examination Patrick advises a leucocyte count whenever the diagnosis is in doubt in cases of pyrexia, for leucocytosis is the rule, and especially of the polymorphs, in all cases of septic infection. He refers to cases of virulent infection without leucocytosis, or even with leucopenia. Leucocytosis is the rule in pneumonia, and the onset of empyema may be shown by a rising temperature and leucocyte count towards or after the crisis. The leucocyte count may be of great value in the diagnosis of appendicitis, as opposed to such conditions as the various forms of colic or tuberculous peritonitis. He lays much stress on the microscopic examination of the urine for pus-cells, for pyuria may exist without being evidenced by the ordinary chemical tests for pus.

In discussing lumbar puncture, Professor Patrick states that it should not be done without consideration, for Weed² showed in experiments in animals that if puncture be done while an organism is circulating in the blood, the needle may convey the infection to the meninges, and set up meningitis which was previously absent. When puncture is indicated, it can be done without an anæsthetic, and without much pain if a fine needle is used.

REFERENCES.—*Glasgow Med. Jour.* 1924, Sept., 137; *Arch. méd. Belges*, 1920, Jan.

RABIES. (See HYDROPHOBIA.)

RADIOTHERAPY. (See also EYE AFFECTIONS, GENERAL—RADIUM IN OPHTHALMOLOGY; SKIN DISEASE, RADIOTHERAPY IN; X-RAY DIAGNOSIS; and under various headings of diseases.) C. Thurstan Holland, Ch.M.

MALIGNANT DISEASE.

A large number of papers on the radiation treatment of malignant diseases are still being published in all parts of the world, but it cannot be said that any particular advance has been made during the past year, although technique, perhaps, has been improved in minor directions. Hernaman-Johnson's¹ paper on "Some Principles of Treatment in the Radiotherapeutics of Cancer" sums up the whole position very fairly. He recognizes that the tissues surrounding a growth play an important part in its cure, and he considers that it is possible to stimulate them by X rays whilst at the same time depressing the tumour cells. He is in agreement,* however, with many other workers that the so-called danger of giving a 'stimulating dose' to a malignant growth—as set forward by the Erlangen school—is a myth. He also is of opinion that the intensive method should rarely be used to render a case operable, and never as a prophylactic after operation. For these purposes the small divided dose is alone suitable. A further paper by the same author² on "The Relative Value of X rays in Various Forms of Malignant Disease", in which, by means of illustrative cases, he graphically demonstrates X-ray possibilities, is also a very clear and valuable guide as to the lines on which this treatment should

be carried out. The author in this paper is quite definite as to the suitability or otherwise of the single massive dose, the divided massive dose, and the repeated small dose.

Finzi,³ in writing upon some developments in deep radiotherapy, describes modifications of technique, some of which have originated in England, and discusses the three main groups, namely, the multiple short-distance fields, the few long-distant fields, and the use of one or two long-distant fields plus a number of accessory short-distance fields. He adversely criticizes the usual German use of an 'erythema dose' on some part of the skin in all patients, and points out its very definite disadvantages in many cases. This paper is also of use as the author suggests the lines upon which future progress may develop, the chief of which are, in his opinion, (1) increasing secondary voltage, (2) improvement of the wave form, (3) increased tube current plus increased filtration, and the use of the tube at greater distances from the skin, (4) increased accuracy in measuring the depth dose, (5) a combination of X-ray and radium treatment, (6) the treatment being carried out at earlier stages of the disease.

A paper by W. A. Evans and P. Leucutia,⁴ which is well illustrated, discusses the deep X-ray treatment of *mammary carcinoma*, and analyses the cases treated by the authors during the past three years. A large number of cases are recorded, and these are divided into five groups, with special reference to the lymphatic system and the mode of dissemination. Full technique is described, as are the principles which underlie it. In summing up, the authors are not enthusiastic as regards pre-operative irradiation, but consider that it remains open for further experimentation; that all operable carcinomas should first be operated upon, and that within ten or twelve days post-operative X-ray therapy should follow; that all inoperable cases should be treated, as in instances apparent cure results, and in all cases palliation and prolongation of life are obtained. The illustrations of certain of their cases fully confirm the latter point.

[The whole question of the radiation treatment of malignant disease is beset by difficulties, and to lay down any rules and regulations is almost, if not quite, impossible: each case must of necessity be considered on its own merits. For many years the X-ray treatment was that of the small multiple dose, given not only to recurrent manifestations, but also to inoperable primary growths and to pre- and post-operative cases. All those who practised in these early days are able to report the (at any rate temporary) disappearance, not only of such things as recurrent nodules as in breast cases, but also of definite malignant growths. Later, as apparatus improved, working, however, on the same lines, it became possible to administer larger and more penetrating doses, and improvement in results followed. Then a few years ago the so-called Erlangen treatment was boomed, and it was announced that the death-knell of cancer was sounded. "A dose of X rays lethal to the cancer-cell could be measured and delivered, and 80 per cent cures resulted; the dose *must* be administered in one sitting."

It was obvious to a good many radiologists that many of the principles upon which this method of administering X rays was formulated were, to say the least of it, very dubious, and time has proved that this was correct. From the start many of us doubted the lethal cancer-cell dose, all of us doubted the necessity of the knock-out blow in one sitting, and many other points in the technique came under adverse criticism. American and English workers, with few exceptions, gave up administering the X-ray dose at a single sitting after a very short trial of its results. It became perfectly obvious that in the treatment of an internal growth (and it was for internal growths that this

method was in the first place designed) it was not possible to measure with exactitude either the depths from various points, or the size, of various growths. It followed that it was therefore impossible to be certain that each cell in the growth received the dose of X rays which was supposed to kill it.

Then a further point laid down by the author of this method was that anything definitely short of the lethal dose stimulated the cancer-cell which received it to greater activity and so did harm. Few of us were prepared to accept this proposition, and the large majority of radiologists agree that there is no evidence of any kind to suggest that by means of X rays it is possible to stimulate the growth of a cancer-cell situated in the living body.

All workers have treated many cases of recurrent breast carcinoma in which the recurrence has taken the form of numerous skin nodules in and around the breast scar. There can be no doubt whatever that in the treatment of these cases a small, constantly repeated dose of X rays is the method of choice, and this whether it is administered by the older methods or by the newer and more powerful X-ray outfits. In such cases almost invariably it is possible to get rid of nodules—they simply disappear—but in all these cases the end sooner or later is inevitable. Now if such nodules disappear, as they unquestionably will, under small doses of X rays far, far removed from the so-called lethal dose, under doses which are described by the Erlangen authorities as 'stimulating doses', what becomes of (1) the lethal dose, and (2) the stimulating dose? The successful X-ray treatment of malignant disease, as it appears in its various forms and manifestations in the human body, cannot, unfortunately, be carried out on such simple lines as the Erlangen method would suggest. The problem is a much greater one than that.

All treatment so far has taken on too much the characteristics of a direct frontal attack, and has been directed solely to the problem of the disappearance of the so-called 'primary growth': surgery by the knife, diathermy, caustics generally, by their direct destructive effect; X rays by their lethal effect on the cancer-cells of the growth. Attack the primary growth, get the wound to heal up, send the patient home, and take no further interest in the problem until such a time as the unfortunate patient returns with obvious manifestations that the disease is still present either in the form of a local recurrence or of a distant metastasis. This is, erroneously, looked upon as the great opportunity for the use of X rays or radium, and it must be admitted that, hopeless as the outlook is, it is in the occasional extraordinary result of radiation treatment in such a hopeless case, or in the marked temporary improvement effected in many others, that there is hope for the future.

Nearly thirty years' experience of this somewhat hideous aspect of the cancer problem, whilst it has impressed us with the feeling that surgery is more or less of a failure if it is considered as a 'cure for cancer', has also impressed us with the feeling that the problem is not only the eradication of the so-called primary growth; but that, in addition, any case must be treated from the point of view of the soil in which the disease is growing, namely, the patient.

Nature has some methods of her own of resistance to the disease, and we cannot expect, except in the somewhat crude ways in which we at present conduct our work, to get to the bottom of the disease unless we consider this side of the question and back up the mere removal of a growth by directing our post-operative treatment to an attempt to prevent its recurrence.

This has been done to some small extent by the post-operative treatment of breast cases by means of X rays. By this is meant a course of X-ray treatment following *immediately* upon the operation, and not a course administered at a later date when recurrence has already taken place. In the latter case much can very often be done for individual patients; in other cases it is

too late for any marked good effect. In the former, although, at any rate at first, this post-operative treatment was carried out chiefly to destroy any cells in or under the skin which might have been left behind, the result appears to be still greater, and apart altogether from any direct action on such cells, radiations—X rays or radium—must have some general effect on the patient, and they appear to bring about some effect which tends to increase the cancer-resistance—if this term may be used—of the patient.—C. T. H.]

Delayed X-ray Burns.—R. Matas⁵ describes in detail two cases in which injurious and destructive lesions caused by previous X-ray therapy did not appear until three and four years after the exposures. In one case death resulted, and in the other recovery after a very serious illness. A further case is referred to, which recovered, in which, following a seemingly irreproachable technique, the delayed lesion commenced four years later. The pathology underlying these burns is a progressive proliferative endarteritis which obliterates the arterioles and leads to a gradual but fatal ischæmia and nutritional changes in the radiated field. The author refers fully to the treatment which is necessary, total excision of the diseased area; and also recommends the use of '*Fischer's fluid*' (incitamin).

Mediastinal Neoplasms.—S. Stern's paper⁶ on the treatment of these growths by high-voltage X-ray therapy is based upon a series of cases illustrated by radiographs taken before and during the treatment. Two methods of dosage are described: one in which large doses are given over as short a time as is possible, then periods of rest, to be followed by further doses; the second by giving smaller and more frequent treatments. The latter produces less reaction, but the author is of the opinion that the massive dosage gives the best results. However, each case has to be considered on its own merits, and no absolute routine technique can be followed. The results appear to show that irradiation is a proper proceeding in all such cases, and should always be given a trial, no matter how small the chance may appear.

Purpura Hæmorrhagica.—H. K. Pancoast, E. P. Pendergrass, and T. Fitzhugh's paper⁷ on the treatment of this disease by irradiation of the spleen describes 6 cases in which they tried the method suggested by Stephan. Of these cases, 2 died, and the other 4, though improved symptomatically, still show evidence of the disease being present. None can be classified as cured. The authors used small doses of X rays directed over the spleen for these six cases; but in view of the fact that splenectomy is of apparent value, they are now experimenting, as being more rational, with massive irradiation of the spleen.

Gynæcological.—J. Borak⁸ reports on the treatment of *climacteric symptoms* by X-irradiation of the pituitary and thyroid glands. This short paper is illustrated by a history of three typical cases in which all symptoms disappeared after radiation treatment. The author explains the nature of the cases in which this method is likely to be successful, and bases his conclusions on a clinical experience of some 50 cases. Of these, 37 had X rays directed upon the hypophysis and 13 on the thyroid. The distressing symptoms disappeared in a remarkably short time in all the cases, and in most so radically that no further treatment was given. He quotes Holzkecht in support of his thesis that the cause of the transitory symptoms must be in the endocrine glands, the hypophysis cerebri and the thyroid; and that it is undoubted that X rays produce the primary effect in restraining function and disabling cells. The full technique, dosage, etc., is explained: it is very simple, and very few doses are necessary.

Tumours of the Skin.—An extremely interesting paper by A. Burrows⁹ on

the treatment of tumours of the skin either by radium alone or in combination is essentially practical. Rodent ulcer in all its different forms is dealt with very completely, also epitheliomata, warts and papillomata, pigmented moles, keloids, and naevi.

Thrombo-angiitis Obliterans.—Some fifty cases of this disease have been treated by H. B. Phillips and I. S. Tunick¹⁰ with X rays. The doses given were essentially stimulating ones, applied at weekly intervals over the mid-anterior and posterior aspects of the body; full details of the technique are given in the paper. The authors claim that under this treatment relief from the severe pain usually occurred almost at once or in the first few weeks of the treatment; that there was pronounced improvement in the intermittent claudication early on; that in a month or six weeks the circulatory and trophic disturbances showed a marked change for the better; ulcers healed; the improvement in the general health was such that many were able to resume work.

Asthma.—G. Marum¹¹ has treated true bronchial asthma with X rays, irradiating the region of the roots of the lungs both from the front and the back. The four areas take from sixteen to twenty minutes, and on an average two to three treatments at intervals of three weeks are necessary. A large percentage of the cases were either cured or markedly improved—statistics are given. The immediate result of treatment is the expectoration of a thin, mucoid sputum. There are no unpleasant results. The explanation of the action of the X rays is unsolved.

Sciatica.—G. Kahlmeter¹² traces the development of X-ray treatment for this condition since a successful case was reported in 1897 of a ten-year-old trigeminal neuralgia. He has treated 33 cases of sciatica in which the duration of symptoms was from one month to three years. Many of these had proved refractory to all other methods. All other treatment was stopped, and X rays alone were given. In 18 cases pain ceased within a few weeks and did not recur—10 of these cases had been going on for more than two years; in 10 other cases improvement followed; in 5 cases there was no result. The author's considered opinion on this method is favourable.

Non-malignant Gastric Diseases.—After reviewing the literature, R. Bensaude, I. Solomon, and P. Oury¹³ describe the technique of the treatment they have used. They give one or two treatments, working with a hard X-ray stream, each patient having from fourteen to sixteen irradiations. The chief result produced is variation in the gastric secretion, which they attribute to a definite selective action of X rays on the structure of the secreting cells; it was proved, for instance, that in about one-third of the cases one dose produced a definite reduction of the acidity, whilst after repeated doses in a few cases the hydrochloric acid disappeared entirely. The patients suffering from gastric ulcer with hyperchlorhydria were those who derived most benefit. The analgesic effect was very inconstant, but in some cases chronic pain was relieved entirely. No other treatment was used, and the authors report six cases in which pain disappeared, there was gain in weight, and the patients resumed normal life.

Pertussis.—R. D. Leonard¹⁴ reports further work and observation upon the use of X rays in this complaint, and his paper is illustrated with charts and with radiographs of chests which show the X-ray appearances before and after treatment. These latter appear to indicate that the beneficial results, which follow in about 75 per cent of the cases, may bear some relation to the effect which the X rays have on the bronchial lymph glands. A more intensive treatment is advocated, but not more than six or seven treatments are necessary, and most of the cases receive only three exposures at intervals of forty-eight hours. The most striking result, as shown by statistics carefully prepared, is an almost immediate and rapid diminution in the number of the

paroxysms, and in their severity. The same author,¹⁵ in another paper, reviews his methods and results over a period of two years. He treated over 300 cases during the autumn and winter of 1922 only. Radiographic illustrations show the marked enlargement of the bronchial glands, and some show peribronchial thickening. There is a further paper by H. L. Bowditch, R. D. Leonard, and L. W. Smith¹⁶ on the same subject.

A leading article in the *British Medical Journal*¹⁷ deals admirably with the present position of the X-ray treatment of whooping-cough, and reference is made to another paper by Bowditch¹⁸ and his colleagues in which a contrast is made between 850 cases treated by X rays only and 150 with X rays plus vaccine. [There appears to be little or no doubt that this method of treatment in these cases has been a distinct advance, and it is one that should receive more attention in this country.—C. T. H.]

REFERENCES.—¹*Lancet*, 1924, ii, 635; ²*Practitioner*, 1924, Nov., 342; ³*Brit. Jour. Radiol.* (Röntgen Soc. Sect.) 1925, 67; ⁴*Amer. Jour. Roentgenol.* 1925, ii, 135; ⁵*Ibid.* 1925, i, 37; ⁶*Ibid.* 1925, ii, 8; ⁷*Ibid.* 1925, i, 558; ⁸*Brit. Jour. Radiol.* 1924, ii, 293; ⁹*Ibid.* 1925, i, 269, 304; ¹⁰*Jour. Amer. Med. Assoc.* 1925, 1469; ¹¹*Strahlentherapie*, 1924, 817; ¹²*Hygiea*, 1925, 1, and *Brit. Med. Jour. Epit.* 1925, i, 69; ¹³*Presse méd.* 1925, 841, and *Brit. Med. Jour. Epit.* 1925, ii, 28; ¹⁴*Amer. Jour. Roentgenol.* 1925, i, 420; ¹⁵*Radiological Review*, 1924, Sept.-Oct., 10; ¹⁶*Amer. Jour. Dis. Child.* 1924, Sept., 323; ¹⁷*Brit. Med. Jour.* 1925, ii, 575; ¹⁸*Jour. Amer. Med. Assoc.* 1925, ii, 171.

RAYNAUD'S DISEASE.

A. W. Adson, M.D., F.A.C.S.

A. W. Adson and G. E. Brown,¹ of Rochester, Minn., deal with the treatment of Raynaud's disease by lumbar ramisection and ganglionectomy and perivascular sympathetic neurectomy of the common iliaes. They state that the underlying symptoms are abnormal sensitivity of the vasoconstrictor nerves, with continuous and intermittent types of spasm of the smaller arteries and arterioles of the extremities. The threshold of stimulation of the vasoconstrictor fibres is low to cold and, frequently, to psychic influences. The colour changes observed in Raynaud's disease are dependent on the arterial constriction. Syncope indicates a complete arterial closure for varying periods of time, and little or no blood in the capillaries or small venules. Asphyxia, which supervenes after a time, is due to the passing of small amounts of blood into the capillaries from both the arterioles and the venules. The capillaries are then filled with static blood.

Complete capillary stasis has been observed for from twenty to thirty minutes. The capillaries become dilated during the longer periods of stasis, the blood becomes blue, and the marked cyanosis of the extremities completes the clinical picture of the capillary phenomena. The period of rubor or compensation is due to the resumption of arterial flow and the rapid change of the cyanotic blood into red oxygenated blood, but as capillary tone is not completely restored, the capillaries still remain partially dilated. There is loss of co-ordination between the capillaries and arterial function during asphyxia. The arterioles are still contracted, although there is intermittent relaxation while the capillaries are dilating throughout the period of stasis, with greater oxygen unsaturation of the capillary blood.

Successful measures for the relief of the vasomotor disturbances should permanently depress or destroy the overactive vasoconstrictor influences of the acral arterioles. These requirements seem to be fulfilled by lumbar sympathectomy. The authors determined to try this measure in the treatment of Raynaud's disease in the lower extremities. The following case illustrates the effects of this operation:—

Report of Case.—A Jewish girl, age 16, had had sore feet for the last six or eight years. There was no indication of any similar trouble in the family history. The patient had had typhoid fever at the age of 3 years, scarlet fever at the age of 6, and

frequent colds and attacks of sore throat. Soreness and sharp pains in the ankles and shooting pains up the legs were occasionally noted. These symptoms had been associated with increasing coldness of the feet. For several years the patient had noticed that her feet became white on rising in the morning, and that they became blue and mottled after exercise. They were never red, and there had never been definite burning or tingling. During cold weather, the pain and soreness was aggravated, and the cyanosis increased. For the last two years a similar condition had been noted in the hands, coldness increasing with varying degrees of cyanosis. Two months before examination, superficial painful ulcers had developed over the malleolar surfaces of both feet.

At examination there was moderate fatty puffiness of the lower legs and feet, and the feet were blue, purplish, mottled, and cold to touch. The toe-nails were slightly thickened, and there were three small superficial ulcers over the internal and external malleoli and at the base of the second right toe. There was marked tenderness of the tibia. All vessels were palpable except those of the left dorsal pedis, which, however, could be felt intermittently. The circulatory efficiency test showed the skin colour to be maintained at an angle of 180 degrees, and mild rubor was present in the legs when in the pendent position. The systolic blood-pressure was 122, the diastolic 84, and the pulse-rate 86. Röntgenograms of both legs gave negative findings. Oscillometer readings with the Pashon oscillometer showed slight pulsation below the ankles and marked pulsation above them. A diagnosis was made of Raynaud's disease with early trophic disturbances.

A bilateral ramisectomy was performed, the second, the third, and fourth lumbar ganglions and trunk being removed on both sides with division of the rami. The outer sheath of the common iliac artery on both sides was stripped for a distance of about 5 cm. Following the operation, the feet were warm and pink; the skin temperature was increased 3° in the right foot and 4° in the left, and the skin was dry. There was a sharp transition in the temperature line about 15 cm. below the iliac crest, the temperature gradually increasing towards the feet. The patient complained of a mild burning sensation in the feet when covered with the bedclothes.

The effects of operation were entirely satisfactory. There was clinical evidence immediately after operation of increased blood-flow in the extremities. Calorimetric studies of the heat radiation in the feet demonstrated an increase of total small calories from 940 to 1500. The mild transitory puffiness disappeared; the skin became excessively dry, and twelve days after operation there was a marked exfoliation of the epidermis of the palmar surfaces of the feet. Three days later, the patient was exposed to an environmental room temperature of 15° C., and the skin temperature of the upper and lower extremities was recorded. The temperature and colour of the feet were well maintained, while the hands became cold and cyanotic, with a fall in the surface temperature.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1925, lxxxiv, June 20, 1908.

RECTUM, CARCINOMA OF.

J. P. Lockhart-Mummery, F.R.C.S.

W. B. Gabriel¹ gives the results of a careful analysis of 143 cases treated by Lockhart-Mummery's Perineal Excision at St. Mark's Hospital. These figures are taken from the hospital records, and include all the cases operated on between 1910 and 1924. The total mortality is 15.4 per cent, but for the last 58 cases the mortality was only 12 per cent. The following table shows the causes of death:—

Cause	Male	Female	Total
Sepsis	7	4	11
Urinary fistula ..	3	1	4
Pneumonia	2	0	2
Shock	1	1	2
Intestinal obstruction	1	0	1
Exhaustion	1	0	1
Indefinite	1	0	1
	16	6	22

Of the 124 cases discharged from the hospital, 44 are known to have died of recurrence, and the following table shows the duration of life of these cases:—

Under 1 year	1-2 years	2-3 years	3-4 years	4-5 years	5-6 years	7-8 years	Over 8
12	17	6	3	3	1	1	1

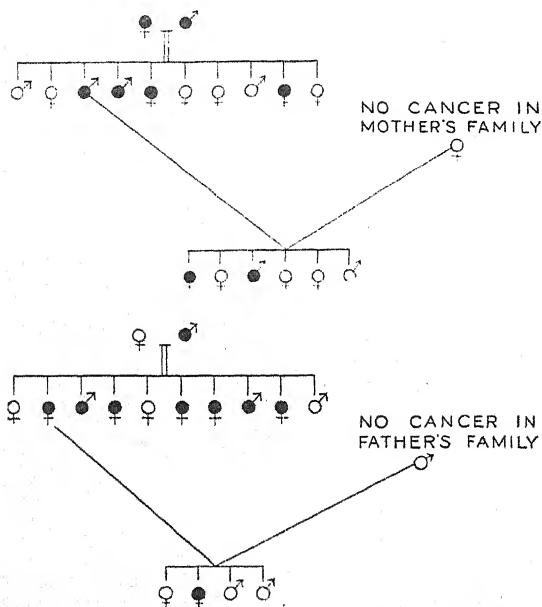
It will be seen that, when recurrence does occur, it generally takes place within three years following the operation.

The percentage of 5-year cures of this series of cases was 28 per cent. The operability rate, that is to say, the percentage of cases presenting themselves for treatment who were considered suitable for operation, was roughly 50 per cent. This is the figure that badly needs improvement, as it means that only one out of every two patients coming to the hospital is sufficiently early to allow of operation being performed. Earlier diagnosis is the only possible

means of improving this figure.

As regards the subsequent functional result, this was found to be very good as judged by the occupations of the patients. Thus, out of the 20 patients who had passed the three-year limit, 6 are women, 5 of whom were able to do their ordinary housework, and one is a stationer's assistant. Of the 14 men, 4 are not working, their respective ages being 65, 71, 72, and 59, while the other 10 are employed as follows: printer's cutter, fish curer, schoolmaster, packer, tailor, pilot, messenger, waiter, platelayer, and odd-job-man.

E. Villard and A. Ricard² describe an **Abdomino-perineal Method** of resecting the rectum with restoration of the anus. Their results show



Figs. 42, 43.—Cancer and heredity. In each chart, cases indicated in black had either cancer or multiple adenomatosis of the bowel, or both. (Re-drawn from the 'Lancet'.)

a 30 per cent mortality from the operation, with 3 cases out of 10 alive three years after operation. A similar operation was performed in this country some years ago, but was discarded owing to its high mortality and unsatisfactory after-results as regards recurrence. Two German papers describing abdomino-perineal excision have appeared, one by A. W. Fischer³ and the other by Prof. Victor Schneider and Dr. Fischer in the same journal.⁴ Neither paper gives the after-results of a series of cases, and consequently they are not of much interest.

Methods of Spread of Cancer of the Rectum.—The importance of studying the methods of spread of growths in the rectum is very obvious if surgeons are to obtain satisfactory results from resection, and Ernest Miles,⁵ from a

careful study of cases of cancer of the rectum both at the time of operation and subsequently, has been able to determine the tissues which are most liable to metastatic deposit during the progress of the disease. These tissues are the ischio-rectal fat, the levatores ani muscles, the pelvic peritoneum, and the pelvic mesorectum. He advocates the complete removal of all these tissues wherever possible at operation.

Lockhart-Mummery,⁶ in a paper on "Cancer and Heredity", gives some interesting instances of cancer in the rectum occurring apparently as an hereditary factor in certain families, and shows that the hereditary factor in these families was not really cancer itself, but the tendency to the development of multiple adenomata and the subsequent development of cancer in one or more of these adenomata at an early age. The charts (*Figs. 42, 43*), show the incidence of cancer in the families of two patients operated upon in St. Mark's Hospital.

REFERENCES.—¹*Brit. Jour. Surg.* 1925, xii, 466; ²*Lyon. Chir.* 1925, March; ³*Arch. f. klin. Chir.* 1924, Nov. 24; ⁴*Ibid.* Dec. 30; ⁵*Lancet*, 1925, i, 1218; ⁶*Ibid.* i, 427.

REFRACTION, ERRORS OF.

Lt.-Col. A. E. J. Lister, I.M.S. (Retd.).

E. Clarke¹ says patients ought always to be reminded that the treatment of their error of refraction is by no means permanent. Changes will take place. Young patients should be examined at least once a year, older ones every two or three years.

The Use of the Electric Retinoscope in Refraction Work: a Study of the Accuracy of Refraction Work based on 1500 Cases.—Practitioners who do refraction work will be interested in this article by C. A. Clapp.² Great care has been taken in this investigation. The author truly says that the observer is apt to make his subjective examination correspond with his skiascopic examination. All the cases were private patients, and the first results were checked by his partner. After trying nearly all of the ordinary methods, the author concludes that the use of the electric skiascope yields the best results in his hands and in the hands of students who have mastered the technique of this instrument. Clapp stresses the following points as essential: Working at a distance of half a metre. Skiascopy under complete cycloplegia. The use of lenses in a hard rubber frame. Macular skiascopy. He concludes that one can skiascope an eye to within a quarter of a dioptre in 90 per cent of cases. He discusses the reasons for variation in the other 10 per cent. He remarks: "As one becomes more expert with the mirror, one loses some respect for the ophthalmometer". The electric retinoscope is portable, requires no fittings, and may therefore interest practitioners who have to do school work in outlying districts, or those who have no electric light or gas available.

The author told the reviewer it was very essential to test a retinoscope, as all are not accurate. Dr. Clapp has kindly supplied the following additional details, for which the reviewer wishes to express his thanks. He tests a retinoscope by taking some simple case of myopia or hypermetropia which has been accurately worked out with the ophthalmometer and trial lenses. A retinoscopy is now done with the retinoscope to be tested. If the result is one-half a dioptre out, he continues the test on other patients. If they are all inaccurate, he rejects the instrument. His preference is for the De Zeng skiascope. He employs 1 per cent atropine solution in the young (ordinarily up to 20), using a drop in each eye three times a day for 6 or 7 instillations. After 20 years, he usually employs a 3 per cent solution of homatropine. One drop is instilled every fifteen minutes for 9 or 10 times. If the paralysis is not complete, further instillations are used. Those not acquainted with American methods will be surprised at the way in which the author uses cycloplegics. A discussion

of this is not possible here. It usually, however, requires a second person to put in the homatropine. This is not always possible, and in most cases a drop of homatropine and cocaine solution, followed five minutes later by a tablet containing $\frac{1}{16}$ gr. each of homatropine and cocaine hydrochloride, is usually sufficient in persons over 20, and often in younger ones also. If it is not, stronger measures can be adopted. In using tablets of any kind, the important point is to see that they do *not get out of the eye, wholly or in part, after being placed there*. This happens sometimes owing to the flow of tears or movements of the lids. If a drop of homatropine and cocaine solution is first instilled and the tablet put in after five minutes, this is less likely to occur. The action of the drug starts at once, and the cocaine makes the placing in of the tablet almost painless. In a sensitive and nervous person, especially in Eastern ladies, this may make a great difference to the ease with which the examination can be carried out later. It saves time in the end, apart from the obvious advantage of making the examination less unpleasant. Some people use tablets of plain homatropine. It would be well for them to try the effect of having one put in their own eye. It is decidedly unpleasant, as the reviewer knows from personal experience.

The Treatment of Myopia in Young Children.—M. L. Hepburn³ says that certain prejudices and fallacies about myopia are deeply rooted in the public mind, and unfortunately in the minds of practitioners as well. The commonest is that short-sighted people get better as they grow older, and that therefore myopic eyes are *very strong*. This fallacy arises from the fact that myopes of a certain degree of myopia do not require glasses for presbyopia, and read without glasses when people with normal distant vision cannot do so. It ignores the fact that the distant vision remains the same, and depends for its perfection on the use of glasses. These fallacies hinder the patient from bringing his child for treatment, while it leads the practitioner to hesitate in expressing his opinion and in sticking to it. The treatment advised, of course, is the constant wearing of carefully prescribed glasses, with attention to the general health, the amount of work done, etc.

REFERENCES.—¹*Refraction of the Eye*; ²*Amer. Jour. Ophthalmol.* 1925, July, 523; ³*Lancet* ii, 123.

"REJUVENATION OPERATIONS."

Kenneth M. Walker, F.R.C.S.

The work of Voronoff¹ in Paris and of Steinach² in Vienna has focused attention on the relation of the internal secretion of the testis to the signs and symptoms of old age, a relationship which was first emphasized by Brown-Séquard³ in 1889. The last-named observer called attention to the similarity existing between certain of the symptoms and signs of testicular deficiency and those that occur normally in old age; for example, the loss of hair, the diminution in muscular and mental vigour, and the gradual failure in the sexual function. Other observers have ascribed to testicular deficiency such senile troubles as enlargement of the prostate and arterial sclerosis. In order to make good this deficiency, various measures have been advocated. But whilst Brown-Séquard relied on intramuscular injections of prostatic extract, Voronoff and his followers have advocated the use of living grafts of testicular tissue, and Steinach has attempted to stimulate the endocrine function of the testis by ligature of the vas deferens. Good results have been claimed from all three methods. It is the object of the following summary to assess the value of such measures and to discuss the scientific basis on which they rest.

Rejuvenation operations rest for their logical justification on two big assumptions: the first that in old age there is a failure in the internal secretion of the testis, the second that this failure can be made good by the methods adopted.

Neither of these assumptions has in any way been proved. Although it is certainly true that in old age there occurs a gradual diminution in the activity of the testis, it is difficult to believe that this is any more than a small part of the general atrophy to which all secretory structures in the body are subject. Together with the degenerative changes in the testis there is a failure in the whole of the endocrine circle, and there are almost as many arguments to support a theory that old age is due to thyroid insufficiency as there are to back the view that it is the result of failure in the testis. It is indeed probable that the signs and symptoms of old age cannot be ascribed to any single cause, but that in their appearance many factors play a part. At the same time it is possible that in some cases failure in the testes plays an important part, even although in others the gonadal factor may be negligible. All that can be said with any degree of certainty is that the internal secretion of the testis is of importance in the maintenance of bodily health, and that a deficiency in it may be a factor in the production of premature old age.

The second assumption, that the proceedings advocated by Brown-Séquard, Steinach, and Voronoff actually succeed in their object of remedying testicular deficiency, rests on more secure foundation. At the same time it must be remembered that even this is without complete scientific proof.

Brown-Séquard based his belief that injections of extract of testis were beneficial in combating the symptoms of old age mainly on personal experience. At the time he was 72 years of age and in failing health; but as the result of giving himself a series of subcutaneous injections of the expressed juice of the testes of dogs and guinea-pigs, he experienced such an improvement in general health that he was able to return to active life in the laboratory. He believed the extract to be 'dynamogenic' in action and to stimulate the exhausted central nervous system. Others have followed Brown-Séquard's example, but on the whole with less dramatic results. Extensive trial has been made recently of injections of testis by Stanley and Kelker.⁴ These observers employed, not an extract of the gland, but a semi-solid mass obtained by cutting up testes into fragments sufficiently small to be capable of injection through a large-calibre needle. The injections were made subcutaneously in the region of the abdomen. For weeks afterwards small nodules could be felt at the sites of injection which slowly disappeared as the tissues were absorbed. Strange to say, very little local trouble would appear to have followed this crude method of injection, and of the 656 individuals treated for various asthenic conditions, 305 were said to have been benefited, as shown by an increase of weight, and improvement in appetite and muscular and mental vigour. It must be admitted, however, that in cases so treated it is very difficult to eliminate the factor of suggestion, for the data by means of which improvement may be gauged are not capable of exact measurement.

Steinach's method of combating testicular deficiency by ligaturing the vas is really the outcome of Ancel and Bouin's⁵ classical experiments on the source of the internal secretion of the testis. These observers found that when animals were subjected to vaso-ligature they gave signs of heightened sexual vigour. At the same time an increase of the interstitial cells of the testis occurred. They assumed, therefore, from this and from other evidence, that the interstitial cells rather than the tubules were the source of internal secretion. Steinach, in his experiments, selected senile animals and obtained similar results. His work was done principally on the rat, an animal particularly well suited for experiments of this kind owing to the fact that its life is a short one and that symptoms of old age are easily recognizable. The results of his experiments were published in 1920 in a monograph, entitled, "Rejuvenation by Experimental Revivification of the Senile Puberal Gland". This title assumes, of

course, that Ancel and Bouin's deductions are correct, and that what Steinach terms the 'puberal gland'—namely, the interstitial tissue of the testis—is the source of the internal secretion. That this is the case is, however, by no means certain. Other observers, and particularly those of the German school, have put a different interpretation on the increase in interstitial cells following ligation. There are many arguments to support the view that the interstitial cells are trophic rather than secretory in nature, their function being to supply a ready source of nutritive material for the use of the tubules. Into this question, however, it is unnecessary to go, for what is of importance is not so much the theory of Steinach's work as its practical value. Whatever the explanation may be, Steinach would appear to have obtained definite positive results by the use of vaso-ligation in senile animals. Previous to operation the aged rats were subjected to a series of tests as to muscular vigour, leaping and climbing power, pugnacity, appetite, and sexual capacity. When an accurate estimate of the condition of the animal had been reached, bilateral section of the vas between ligatures was carried out. No alteration was as a rule noted for a period of two to four weeks after operation. Subsequently in many of his animals there was noted a gradual increase in sexuality, an alteration in the carriage of the head, an improvement in the condition of the fur, and an increase in appetite, muscular energy, and pugnacity. Ultimately, after a period of a few months—corresponding in the life of a human being to about ten years—the improvement was lost, and the animal relapsed into senility and died. The average life of the ligatured animals was longer by some 20 per cent than that of the controls.

Liebinger has attempted to discount these results by suggesting that Steinach's rats were suffering not from old age but from mange, and that the improvement in their coats and general condition was simply the result of the good feeding and attention they received in Steinach's laboratory. It is, however, difficult to accept this as an explanation. Macht, in America, has confirmed the improvement in muscular co-ordination that follows ligation in old rats, and Knud Sand⁶ has obtained similar results in senile dogs.

During the last six years numerous workers have employed Steinach's methods on human subjects, amongst others Lichtenstern, Peter Schmidt, Benjamin, Sand, and the writer.⁷ It is difficult to summarize the results owing to the absence of measurable data by means of which improvement can be gauged, and also to the impossibility of excluding the action of suggestion. Of 13 cases ligatured by Sand for senility, 9 were benefited. Lichtenstern also reports favourably, and states that in certain cases the operation was performed without the knowledge of the patient, so that suggestion could be eliminated. In the opinion of Schmidt no good results may be expected in those cases in which the testicle of the patient gives evidence of senile atrophy. All observers remark on the variable latent period that occurs before any improvement is noted. In certain cases ligatured by the writer and Mr. J. A. L. Cook, in which, owing to the death of the patient from malignant disease, an examination of the tied testis was possible, no changes were found until at least six months after the operation.

Summarizing, therefore, the results obtained in the human being, it may be said that the operation is still *sub judice*, that there is a long latent period before any improvement occurs, that a healthy condition of the testes is necessary for success, and that in the opinion of those who have employed the method most extensively no harm results from the operation even in those cases in which it fails in its object.

In the third method of combating testicular deficiency, by means of grafts, the two chief obstacles encountered are the difficulties of obtaining material

and the impossibility of ensuring that the transplants survive. In order to overcome the first difficulty, Voronoff and Thoreck have made use of grafts obtained from the higher apes, whilst Lidstone, Lichtenstern, Martin, Lespinasse, and the writer have had recourse to human testes removed on account of ectopia, or else obtained from patients dying of accident. In either case it is certain that,* even if the grafts take, they undergo gradual absorption. This is undoubtedly more rapid in the case of grafts obtained from anthropoids than of those derived from human sources. The same difficulty is experienced in assessing results as in the case of patients subjected to Steinach's operation. Voronoff, however, claims definite success in senile patients, and considers that the operation is vastly superior to that of vaso-ligature. In his opinion the graft survives for a period of three or four years, when, if necessary, it may be renewed. The writer's belief is that a heterograft disappears more rapidly than this, and that even if human material is used its life is not likely to be more than two years. At the same time it is obvious that if material is available a graft offers greater chances of success than ligature of the vas, since results are not dependent on the capacity of the patient's testis to respond to the stimulus. The benefits more commonly noted are an increase in muscular and mental vigour and an improvement in general health. A return of sexual power is less likely. The operation itself presents no difficulty. Various sites for transplantation have been selected: within the tunica vaginalis, in the rectus sheath, and beneath the peritoneum. On the whole the cavity of the tunica vaginalis would appear to be the most satisfactory, the effusion that follows the operation furnishing a bath of nutritive material that nourishes the graft until vascularization has taken place.

The foregoing may be epitomized in the following conclusions: (1) Although testicular deficiency is certainly not the only cause of old age, it is an undoubted factor in some cases. Consequently, if this deficiency can be made good, the patient will experience an improvement in general health. (2) When material is available, a graft is more likely to remedy this deficiency than a ligature operation, but even when successfully implanted, the graft has a limited life. More lasting results are likely to be obtained from the use of homografts than of heterografts. (3) The results of vaso-ligature are erratic, since the operation depends for its success on the power of the testis to respond. When such a response results, it may occur only after a long latent period. (4) The most suitable cases for treatment are those in which no organic disease can be found to account for a condition of premature senility.

REFERENCES.—¹*Greffes Testiculaires*, Paris, 1923; ²*Verjüngung*, Berlin, 1920; *Arch. f. Entw. mech. der Organismen*, Leipzig, 1920, xlii, 557, 618; ³*Comptes rend. Soc. de Biol.* 1889, 415; ⁴*Jour. Amer. Med. Assoc.* 1920, lxxv, 1501; ⁵“Recherche sur le Rôle de la Glande interstitielle du Testicule”, *Comptes rend. de l'Acad. des Sciences*, 1903, Dec.; ⁶*Jour. d'Urologie*, 1923, June; *Endocrinology*, 1922, March; ⁷*Lancet*, 1924, i, 16.

RETINA, AFFECTIONS OF. (See EYE AFFECTIONS, GENERAL.)

RHEUMATIC HEART DISEASE. (See HEART DISEASE, RHEUMATIC.)

RHEUMATIC INFECTION IN CHILDHOOD. *Reginald Miller, M.D., F.R.C.P.*

Rheumatism in infancy is usually regarded as one of the rarities of medicine, and the immunity of the infant to this particular infection may be thought to be due to lack of exposure rather than to any inborn immunity. E. Pritchard¹ very pertinently questions these commonly accepted views, and thus raises a most interesting query, to which, as he rightly says, comparatively little attention has been paid. Is it true, he asks, that infants, who so readily suffer from other infections, show this extraordinary immunity to rheumatic

infection? For himself he doubts the truth of this. He suggests that some of the catarrhal complaints of infancy, enteritis and colitis, and some skin lesions such as urticaria and eczema, are truly rheumatic in infancy, and that these manifestations serve to defend the infants from the further onslaughts of the rheumatic virus.

TREATMENT.—M. Raven² calls attention to his view of the importance of Fresh Air in the treatment of the convalescent rheumatic child or the patient with rheumatic damage to the heart. His theory is that, rheumatism being an infection, and frequently a chronic smouldering infection, it should be treated as other infections, by as much fresh air as possible; hence, with certain modifications, he orders a régime not unlike that given to cases of surgical tuberculosis. [The present writer has recently had the opportunity of seeing Dr. M. Raven's cases in their wards set apart for them at St. Mary's Convalescent Home, Broadstairs. It is certainly a surprise, knowing the type of case therein, to see a series of fat high-coloured faces in a row of beds, and the surprise is accentuated by the discovery of the severity of the heart lesions present in most instances. In London in such cases of heart disease one knows only too well the unhealthy look which the children would show. Thus the immediate effect on an observer is a tendency to conclude that the rheumatic toxæmia has been conquered by this line of treatment; but due allowance in altering a child's appearance must be given to Broadstairs' sun and air, and the ultimate result of this régime can only be enunciated after long and careful consideration.—R. M.]

REFERENCES.—¹*Med. Jour. and Record*, 1925, 479; ²*Lancet*, 1924, ii, 564.

RHEUMATISM. (*See also* HEART DISEASE, RHEUMATIC; JOINT SURGERY, RECONSTRUCTIVE.) *Ivor J. Davies, M.D.*

The importance of invalidity from chronic joint affections cannot be over-estimated. The Ministry of Health Report on the Incidence of Rheumatic Diseases shows that chronic joint diseases cost the approved societies nearly £1,000,000 a year in sick benefit, and the annual loss of over 1½ million weeks of work.

NOMENCLATURE AND CLASSIFICATION.

Acute Rheumatism.—It is difficult in the present state of our knowledge of etiology and pathology of these diseases to adopt a satisfactory classification. The term 'rheumatism' should be discarded, for, as J. R. Kerr¹ suggests, it is misleading and a source of danger to the patient. 'Rheumatism' may be of little significance in the adult, but is fraught with the most dire consequences to the child. The term should be restricted to the disease 'acute rheumatism', as W. G. MacCallum² of Baltimore suggests, so as to indicate 'acute rheumatic carditis' in children, and 'acute rheumatic arthritis' in adults. In a campaign for the prevention of heart disease, which should be the duty of all civilized communities (*see* PREVENTION), education of the public must necessarily be a factor of prime importance. A 'broadcast' effort should be made to instruct the people that 'rheumatism' in the young means 'acute heart disease'; and if every practitioner in the land would assist in the crusade by a persistent reiteration of this fact, the opportunity for early treatment of rheumatic children would be greatly increased. Lasègue has aptly said that rheumatism is a disease which "licks the joints but bites the heart".

Rheumatoid Arthritis.—This term has received the approval of Professor Stockman,³ of Glasgow, but it cannot be said that the title is satisfactory. It is now generally agreed that the affection has no relation to true rheumatism, and consequently the term 'rheumatoid' is inaccurate. 'Arthritis deformans'

would be a far better title, and would also be of suggestive value to the laity, for if its dire possibilities were better known, the afflicted (women especially) would be far more likely to seek early treatment. When the affection is controlled, by measures to be described, the term 'arthritis deformans' would be a misnomer, and perhaps then a designation of 'peri-arthritis' would be more appropriate. Osteo-arthritis, often monarticular and affecting the hip or shoulder, is a fairly definite clinical entity, and is a far more accurate description of that disease than the terms used for the other affections. R. L. Cecil and B. H. Archer,⁴ of New York, have in a study of 50 cases established some claim for separate classification of an 'arthritis of the menopause'—a chronic polyarthritis of obese middle-aged women, occurring at or just after the menopause, and characterized by persistent stiffness and pain in the knees, feet, and distal phalangeal joints, which showed lesions identical with those of Heberden's nodes. The features closely correspond with those of osteo-arthritis, but perhaps a separate description is justifiable in view of the results of treatment, which will be described under that heading.

ETIOLOGY.

Acute Rheumatism.—Although no micro-organism has been definitely established as the cause of the disease, yet the evidence is highly suggestive of a specific infection—a view long held by F. J. Poynton, and recently supported by Carey Coombs,⁵ who, in an investigation of over 600 cases of rheumatic heart disease, maintains the essential specific character of the lesions. The subcutaneous nodules, as W. G. MacCallum² affirms, "seem to be most definitely and specifically related to the clear-cut disease rheumatism, occurring frequently but not constantly in that disease and never otherwise". The reviewer, in an extensive O.P.D. experience, has only seen subcutaneous nodules apart from acute rheumatism in one case, viz., a case of 'gonorrhoeal rheumatism', despite a careful search in all cases of arthritis. The nodules may be regarded as articular vegetations, for they are the peripheral equivalent of the endocardial vegetations. A more systematic search would probably show that these small nodes of the disease occur more commonly than is generally believed. When present around the elbow, the most common situation, a nodule is often perched on the internal condyle, the most accessible bony point in the body. The 'Aschoff body'—a nodular grouping of cells in the myocardium and elsewhere, including the nodules—as demonstrated in MacCallum's paper, is probably a specific lesion of the rheumatic virus. It is composed chiefly of conspicuous large cells with one or more large vesicular nuclei. The nodule is a sign of evil omen, as it indicates a severe type of the disease, and one likely to lead to an early fatal termination. Vincent Coates,⁶ of Bath, has drawn attention to the subcutaneous fibroid nodule as an early manifestation of rheumatic infection in childhood. F. G. Crookshank,⁷ discussing the morphological factor in respect of rheumatism and other affections of the joints, suggests that in subjects of acute rheumatism the lacunar system—the lymphatic and serous complex—offers less resistance than is normal to certain infections. Llewellyn Jones Llewellyn,⁸ writing on endocrines in relation to rheumatic fever and rheumatoid arthritis, believes that children of rheumatic stock show thyroid instability, with alternating periods of hypothyroidism and hyperthyroidism, and recommends a cautious trial of thyroid therapy when hypothyroidism is present in cases refractory to salicylates.

Rheumatoid Arthritis.—The disease is undoubtedly of infective origin, non-specific, and probably arises from various organisms, the *Streptococcus viridans* being most commonly found. R. Stockman,³ Wm. Willcox,⁹ and N. P.

Stauffer,¹⁰ of Philadelphia, discuss this question, and emphasize the importance of a careful search for a focus of infection. The most common sources of sepsis are the mouth, tonsils, nasopharynx, maxillary antra, accessory sinuses, and the alimentary and genito-urinary tracts. N. Mutch,¹¹ in a study of 200 cases, says that stasis often occurs in the colon or ileum without symptoms referable to the alimentary tract; streptococci predominating in the small bowel and *B. coli* in the other. Masked stasis is revealed by systematic radiography. Perhaps the trend is to condemn the mouth too readily, to the advantage of the dentist, but without commensurate benefit to the patient, other possible sources of sepsis being overlooked. Again, if accessible seats of infection are found negative, we profess wisdom, and without further proof inculcate the alimentary tract. Willcox⁹ refers to indicanuria as a valuable sign of colon toxæmia. R. Burbank and L. G. Hadjopoulos¹² have investigated the serological significance of streptococci in arthritis and allied conditions, and describe their technique for bacterial fixations in using active serum; they classify various arthritic and rheumatoid conditions into three main groups, two reacting to hæmolytic streptococci, and one to streptococci of the *S. viridans* type. They confirmed serologically certain pathological conditions which have long been known clinically to be precursors of arthritis.

A. H. Douthwaite,¹³ in an investigation of 50 cases of rheumatoid arthritis, found pigmentation of the skin to be present in 29 cases, and, remarking upon the possible association between such pigmentation and the constantly low blood-pressure found in these cases, states: "It seems not unreasonable to assume that the general constitutional disturbance of rheumatoid arthritis may involve the suprarenal bodies, with depression of function and reduction of adrenalin output, with consequent lowering of blood-pressure, increased melanin formation, and pigmentation". Achlorhydria or marked hypochlorhydria, stressed by other observers as playing a part in the infective process, were not found in 30 of Douthwaite's cases examined by the fractional test meal, except in 2 cases which showed definite hypochlorhydria. Cajori, Crouter, and Pemberton,¹⁴ of Philadelphia, have investigated the lactic acid content of the blood, urine, and sweat in arthritis and rheumatic disabilities, but no abnormality was found. Clausen's method for the determination of lactic acid was used.

The British Medical Association, at the Annual Meeting at Bath, 1925, discussed the causation and treatment of rheumatoid arthritis.¹⁵ Sir Humphry Rolleston in the opening paper reviewed and criticized the question of etiology, and described the various methods of treatment. He suggested the following questions for discussion: (1) Is rheumatoid arthritis always infective in origin? (2) What is the relation of tuberculosis elsewhere to chronic arthritis? (3) What share do constitution and disorders of metabolism take in its causation? (4) Are the arthritic and endocrine disorders both due to infection, or does metabolic disorder sometimes precede and dispose to infective arthritis? (5) Treatment by endocrine therapy, dietetic modifications, and protein shock. Infection was considered to be the most important factor in the etiology of the disease. The question of the relation of tuberculosis elsewhere to chronic arthritis received a general negative reply. The next question was hardly attempted, but as pointed out in a subsequent leading article in the *British Medical Journal*,¹⁶ constitutional and metabolic disturbance forms a striking feature in a number of cases. Professor R. B. Osgood, of Harvard University, and Sir Robert Jones laid stress on the prevention of deformity, and the latter described the methods of its correction. Professor A. Cawadias, of the University of Athens, referred to his researches on sulphur metabolism in the disease, and described a syndrome of sulphur demineralization, and another of

sulphur hypo-oxidation, the former being more specific in rheumatoid arthritis, and an indication for the therapeutic use of sulphur. In closing the discussion, the President of the Section of Medicine (Lord Dawson) referred to Professor Cawadias' contribution as being suggestive of the co-operation of the bio-chemist in an investigation of the factor of low resistance.

TREATMENT.

Acute Rheumatism.—

Diet.—A. H. Wright,¹⁷ of Toronto, recommends a more liberal diet in acute rheumatism. Milk soon after reaching the stomach becomes a solid food which is more or less difficult of digestion. There is no valid reason for withholding light, nutritious, solid food in cases of fever, unless the digestion is much enfeebled. Anæmia, often profound, is a feature of acute rheumatism, and a suitable diet is a matter of great importance. Milk is the best food for infants and young children, and to a less extent for the aged. Wright has observed that in the continued fevers, especially rheumatic, patients took milk willingly in the first week but tired of it in the second. He states: "A properly balanced diet is our most important safeguard against various diseases, of which one is rheumatism". He aims at giving sufficient for hunger without causing satiety, and is largely guided by the appetite. The foods are selected in their order of digestibility, and in sufficient variety. The following articles of diet form the basis of the dietary: Milk 1 to 2 pints, or substitutes, as butter-milk or soured milk; a good variety of starchy foods, as bread and milk, porridge and milk, light milky puddings. Vegetables, and especially potatoes, which are a good food and easily digested. Fruits—baked apples or apple sauce, and "peaches placed in boiling water with the skins on"; the pulp of grapes is permissible. Meat extracts and broths are given at any stage, and within a week small quantities of roast, broiled, or boiled meats are given once a day only. Ordinary simple beverages are allowed according to desire. Water is taken before each meal, and freely in the course of the day. A diet formulated on these lines is rational, provided that digestion is carefully watched and individual idiosyncrasies are observed.

J. A. Turnbull¹⁸ states that food allergy is an important factor to be investigated as well as other sources of arthritis, and he eliminates any foods to which the patients are sensitive, with good results.

D. Daniélopou,¹⁹ of Budapest, advocates massive doses of *Salicylate of Soda* for acute rheumatism, carditis, and chorea. He says: "Beginning with 120 gr. a day for an adult, 80 gr. for a child, and 30 or 40 gr. for children under eight years of age, I increase the dose 15 or 20 gr. a day until I reach 4 or 5 drachms a day in an average case, and as much as 8 drachms a day in a severe case. My practice is to gradually increase the dose of salicylate until there is manifest improvement, whereupon I maintain that dose until the joint symptoms and fever have subsided. Not until that result is obtained is it permissible to think of reducing the dose, and then not more than 20 or 30 gr. every other day. In presence of gastric disturbance we must not interrupt the salicylate for more than from 6 to 24 hours. As to the duration of the treatment, in an average case it takes 45 days, but more in severe cases. Each dose of salicylate should be dissolved in half a tumbler of water and followed by food." He insists on the value of *Bicarbonate of Soda* in preventing the development of toxic symptoms. Twice as much bicarbonate as salicylate should be given.

Rheumatoid Arthritis.—Early diagnosis is essential to success. The ordinary general principles of treatment are observed with a view to an improvement in general health. Exercise in the sun is most valuable. When possible, the

patient should winter in a warm, dry climate, and preferably that of Egypt or North Africa (inland).

Vaccine Therapy.—This is well worth a trial when focal sepsis is present, and an autogenous vaccine prepared. Owing to hypersensitization, Willcox⁹ recommends very small initial doses of vaccine of a strength of 50 million streptococci per c.c. and an initial dose of 1 min., increased by 1 min. with each subsequent dose at intervals of one week and later fortnightly or longer. Douthwaite¹³ obtained highly satisfactory results when desensitization was done before each injection of the main dose sub cutem, by the injection of a minute quantity (a quarter of a million) intravenously. This method permitted of a much more rapid increase in dosage when required. Any septic foci should be eradicated.

Non-specific Protein Therapy or Protein Shock Therapy.—D. Campbell,²⁰ of Glasgow, has treated 70 cases, with beneficial results in 58, in whom infection appeared to be inhibited when they left hospital. The best results were obtained in cases with an acute onset. Typhoid vaccine was used as the source of the foreign protein. The initial dose was 100 million organisms in 5 c.c. of normal saline solution intravenously. A diphasic reaction follows, first with general malaise and increased symptoms, and second with considerable general and local improvement. The succeeding doses were 125, 150, 200, and 250 million organisms respectively at intervals of from four to six days. In the intervals the patients were encouraged to take as much exercise as possible. Campbell believes that protein shock therapy in the present state of our knowledge offers greater probability of success than any other mode of treatment, and Stockman³ concurs in this view.

Medicinal and Physiotherapeutic Treatment.—Willcox⁹ recommends **Guaiaecol Carbonate** 10 gr. three times daily, to which he adds a few grains of **Acetylsalicylic Acid** if much pain be present; also **Tincture of Iodine** (French Pharmacopœia, without potassium iodide) 4 min. in a little milk or water three times daily. [The reviewer has had good results with **Iodolysin** and the ordinary physiotherapeutic methods.—I. J. D.].

W. J. Monaghan and F. Garai,²¹ of New Jersey, report favourably upon the use of activated colloidal Sulphur in the treatment of acute and chronic polyarthritis, arthritis deformans, and septicæmias. The preparation known as '338' contains sulphur in a particular dispersion, and is said to possess an electric charge rendering it highly physiologically and chemically active. It is given intravenously, and in over 600 injections no serious reaction ensued. H. A. Reimann and G. W. Pucher,²² of Buffalo, also claim good clinical results by the use of sulphur in cases of arthritis without gross bony changes. They used flowers of sulphur (7 mgrm. to 1 c.c.) dissolved in olive oil, and injected 1 c.c. intramuscularly as the initial dose, adding 1 c.c. to each subsequent dose at weekly intervals for two months.

C. Sundell,²³ London, employs **Pyretic** treatment, and claims cures in severe cases of chronic rheumatism after the failure of radiant heat, diathermy, and immersion baths. A. G. Dampier-Bennett²⁴ procured successful results in cases of chronic arthritis by means of heat and light baths. R. L. Cecil and B. H. Archer⁴ obtained good results in arthritis of the menopause by a régime of **Low-calory Diet**, **Physiotherapy**, and **Iodide** in the form of the potassium salt, or in drachm doses of the syrup of hydriodic acid.

Orthopædic Treatment.—Professor J. Russell²⁵ writes on the surgical aspects of rheumatoid arthritis and describes the orthopædic principles in treatment. He affirms that much of the deformity is preventable and can be avoided by correct posture during the acute stages. The patient can greatly assist by moving the affected parts as much as possible, so as to prevent the flexion

contractures. B. Whitechurch Howell²⁶ also details the principles of orthopaedics underlying the treatment of arthritis, and believes that it can often be cured in the early stages, and that much can be done in the late stages.

A good prognosis is of the utmost value, and particularly because the condition is universally regarded as being hopeless and incurable. This attitude is no longer justified, if early and energetic treatment be employed. The patient can assist very materially in the cure through co-operation and determination to prevent deformity. There is no problem yet unsolved more promising than the one of rheumatoid arthritis, for the disease is already under control through enthusiastic team work.

PREVENTION OF ACUTE RHEUMATISM.

F. J. Poynton,²⁷ in the Bradshaw Lecture delivered at the Royal College of Physicians, adds an authoritative contribution to this subject. The problem is of vital national importance, and ranks with tuberculosis in its incidence and economic effects. Poynton refers to the many difficulties, and more particularly to the lack of exact knowledge in etiology. The streptodiplococcus associated with the names of Poynton and Paine as a result of careful and prolonged research is at least a good working hypothesis, whose confirmation or disproof on further inquiry will probably establish the specificity of the disease. A reference is made to secondary factors such as environment, and it will be generally agreed that some of the worst cases of rheumatic carditis occur in certain districts, and in damp and cold houses. Cold winds and much dust following a spell of hot weather are responsible for the occurrence of tonsillitis and an increase in the incidence of acute rheumatism. These and other factors require the close co-operation of the public health authorities in the investigation. Poynton also refers to the removal of local focal infections such as diseased tonsils or carious teeth. We need an elucidation of special factors which appear to predispose certain families to acute rheumatic infections. Mental strain at school acting on constitutions susceptible to the infection is held as being an important accessory cause of the disease, and more especially of its cerebral manifestation, viz., chorea.

In prevention, Poynton points out the weak links in the chain of official medical supervision of the individual. One is between the infant welfare centre and school inspection, the other between the latter and National Insurance. The general practitioner in present conditions of medical service can alone bridge these gaps, and his whole-hearted co-operation is essential to success in any plan of campaign. A keener sense of prevention will undoubtedly be a feature in future medical practice, and education is becoming more and more practical with the extension of knowledge. Carey Coombs has suggested that practitioners could group themselves voluntarily in various districts, and pool their special knowledge and experience, and especially where the disease is epidemic, or on the appearance of a local epidemic. Poynton emphasizes the absolute need for 'recovery hospitals' in the country adjacent to the general hospitals, which would be either special or sectional. He favours the sectional plan, but a disadvantage is immediately apparent. A prolonged convalescence in rheumatic children is very difficult to maintain under the best of circumstances. The child is more or less a caged animal, and looks with envy upon its more active non-rheumatic playfellows. It is obvious that such children could be more easily restrained in a special hospital. Education could be resumed, and must be made easy and attractive. Graduated games and physical exercises would also be helpful in classification of the ultimate degree of recovery. Several of these institutions are now established in our country, and already show most encouraging results. America through

its National Association for the Prevention of Heart Disease has taken up the issue with commendable thoroughness.

REFERENCES.—¹*Lancet*, 1924, ii, 1217; ²*Jour. Amer. Med. Assoc.* 1925, May 23, 1545; ³*Glasgow Med. Jour.* 1925, Feb., 73; ⁴*Jour. Amer. Med. Assoc.* 1925, Jan. 10, 75; ⁵*Rheumatic Heart Disease*, 1924, John Wright & Sons Ltd., Bristol; ⁶*Brit. Med. Jour.* 1925, i, 550; ⁷*Med. Jour. and Record*, 1925, May 20, 615; ⁸*Ibid.* 618; ⁹*Practitioner*, 1925, May, 326; ¹⁰*Med. Jour. and Record*, 1924, Dec. 3, 542; ¹¹*Ibid.* 1925, May 20, 625; ¹²*Jour. Amer. Med. Assoc.* 1925, Feb. 28, 637; ¹³*Brit. Med. Jour.* 1925, i, 1171; ¹⁴*Arch. of Internal Med.* 1924, Oct., 566; ¹⁵*Brit. Med. Jour.* 1925, Oct. 3; ¹⁶*Ibid.* Oct. 10; ¹⁷*Med. Jour. and Rec.* 1925, May 20, 627; ¹⁸*Boston Med. and Surg. Jour.* 1924, Sept. 4, 438; ¹⁹*Med. Press and Circ.* 1924, ii, 345; ²⁰*Glasgow Med. Jour.* 1925, Feb., 79; ²¹*Med. Jour. and Record*, 1924, July 2, 24; ²²*Amer. Jour. Med. Sci.* 1924, July, 77; ²³*Practitioner*, 1925, March, 208; ²⁴*Ibid.* 1924, Dec., 426; ²⁵*Glasgow Med. Jour.* 1925, Feb., 90; ²⁶*Practitioner*, 1924, Sept., 169; ²⁷*Brit. Med. Jour.* 1924, ii, 986.

RHINITIS. (See NOSE, DISEASES OF.)

RIBS, CERVICAL, IN CHILDREN. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

A. H. Southam and W. J. S. Bythell¹ call attention to the fact that the presence of cervical ribs as a possible cause of symptoms in children has not been sufficiently considered. The first case mentioned in this paper was a girl 4 years old; bilateral cervical ribs were shown to be present. There were no symptoms in this case, but two hard masses could be felt above the clavicle. In the second case, the pressure effects were so definite that operative treatment was clearly indicated. The patient was a girl of 12. A large cervical rib was found on the left side arising from the seventh cervical vertebra; the symptoms were those which one ordinarily finds in adults suffering from cervical ribs, or pressure of the nerve trunks on a normal first rib. After removal of the cervical rib, pain and muscular wasting disappeared. In the fourth case mentioned, a right cervical rib was removed in a girl of 15 on account of the pain of the arm and the wasting of the small muscles of the hand. The writers conclude: (1) Cervical ribs are congenital abnormalities and may be found in children at all ages. (2) In 13 recorded cases, 12 were bilateral, and 10 occurred in girls. (3) Their diagnosis will frequently only be made after radiographic examination. (4) In the majority of cases symptoms do not appear till adult life is reached. (5) The delay in the onset of symptoms may be due to the ossification of the rib, which is not complete till about the twenty-fifth year. (6) In young children, however, they occasionally give rise to very definite symptoms in the upper limb similar to those seen in adults. (7) In others their presence may lead to a diagnosis of spinal caries or torticollis, and the differential diagnosis can be established only by radiography. (8) Only rarely will treatment by operation be considered necessary.

REFERENCE.—¹*Brit. Med. Jour.* 1924, ii, 844.

RICKETS. (See also FACIAL IRRITABILITY; FRACTURES—THE CHEMICAL BASIS OF FRACTURE REPAIRS; TETANY.) *Reginald Miller, M.D., F.R.C.P.*

PATHOGENESIS.—This aspect continues to attract most attention, together with the allied question of treatment. L. Findlay's lecture¹ is perhaps the most comprehensive of the year's output, and will be first reviewed. His summary is of importance: "Perhaps there is no disease, and certainly no disease in the domain of pediatrics, which has been the subject of so much study in so short a space of time. This work, both in the clinical and experimental fields, has accumulated, it must be admitted, a vast amount of information regarding the metabolism of various elements in rickets, and has revealed to us some hitherto unsuspected factors that influence ossification. It has demonstrated for us that there are at least five factors, viz., sunlight,

exercise, vitamin X, calcium, and phosphorus, which definitely influence this physiologic process, *but it has not yet disclosed, I personally feel convinced, the true or exciting cause of rickets*". [Italics ours.—R. M.] Findlay holds that the absence of sunlight is not the potent factor in the pathogenesis of rickets that some writers would have us suppose, and that sunlight alone, without exercise, will not prevent the disease. Lack of exercise has the same type of evidence in support of its etiological significance as have cod-liver oil and sunlight. Further, the advocates of sunlight are not agreed as to the particular rays which may possess the protective power. Röntgen rays, in his experience, might have the most rapid beneficial effect of all. As regards the vitamins, the antirachitic vitamin, called by Park the vitamin 'X', was at first accepted as identical with the fat-soluble A, but it is now recognized that, if it exists at all, it is a different substance, though frequently associated with fat-soluble A. When we pass to consider the question of the calcium and phosphorus factors in the production of rickets, the difficulties in obtaining anything like decisive answers are increased. The old question remains: Why is it that a child who is getting ample calcium in its food, and often an excessive amount in comparison with what nature intended for its supply, should have bones so poor in this element? The crux of the matter seems to be, is the calcium absorbed from the intestine in sufficient amount? In view of the fact that he finds both a diminished calcium retention and a diminished excretion of calcium in the urine in rickets, Findlay argues that there must be a defective absorption of calcium from the bowel. Orr, working at Baltimore, agrees with Findlay and the Glasgow school in this most important point. What causes this diminished absorption is at present very obscure. Findlay is inclined to think that perhaps in the upper parts of the intestine in rickets there is some increased precipitation of calcium, so preventing all calcium of the food becoming soluble.

This brings us back to the old view that rickets is primarily produced in the gastro-intestinal tract. A. Webster and L. Hill² discuss the same question, and agree that in rickets there is a defective absorption of calcium from the intestine. They quote experiments of Zucker, Johnson, and Barnett which show that if a rickets-producing diet is kept acid no rickets will develop. It is thought that the acidity prevents the precipitation of calcium referred to above.

Webster and Hill have made a number of experiments on rats with a view to studying the potency of antirachitic measures, foods, and drugs. They "feel justified in making the broad generalization that, provided an animal is supplied with food just sufficient to maintain life and a little growth and a bare minimum of the bone-forming elements calcium and phosphorus, then, if ultra-violet light be supplied in adequate amounts, rickets will not develop, however unfavourable the animals' environment may be". Sulphur they found to have an uncertain preventive action. Purges like magnesium sulphate, disinfectants like thymol, arsenic, the breathing of irradiated air, did not prevent rickets. This conclusion, it will be seen, is diametrically opposed to Findlay's statement that he has seen rickets develop in animals kept plentifully supplied with direct sunlight but deprived of exercise.

Both phosphorus and calcium are necessary for bone formation. In active rickets the blood serum shows fairly constantly a diminished phosphate content; the calcium content, according to G. H. Anderson,³ is diminished only where tetany is present (*see TETANY*). It has been found that the blood phosphate has a seasonal curve, and reaches its lowest at the end of the winter months. L. R. De Buys and L. von Meysenburg⁴ have attempted to make use of this serum examination for the purpose of recognizing rickets at its

earliest, and for differentiating active from quiescent rickets. Their radiological and biochemical results were in accord.

DIAGNOSIS.—The early diagnosis of rickets by clinical means has been investigated by H. E. Utter⁵ and C. Ulysses Moore.⁶ Chiefly the condition of the bones of the skull has attracted their attention, and they tend to stress the importance of a yielding condition of these bones near their sutures, which they term craniotabes. In English teaching it has been the custom to limit the term craniotabes to a localized thinning of the cranial bones, and to exclude the diffuse yielding of the bones so frequently found in very young babies as not significant of rickets. It is this latter condition which these authors are stressing: they find it present in 60 to 80 per cent of winter-born babies.

TREATMENT.—The value of **Cod-liver Oil** in the treatment of rickets has been known for decades: doubtless some will be relieved to hear that, tested by skiagraphic and biochemical tests, the action of cod-liver oil passes with flying colours. Findlay is, perhaps, the most critical: he thinks that it produces greater improvement in the bones than it does constitutionally. He regards **Massage** as an essential, or at least an important, part of the treatment, but is satisfied with the results obtained by combining massage and cod-liver oil administration.

The effect of **Ultra-violet Rays** continues to receive excellent reports from many quarters: A. H. Tubby,⁷ A. B. Marfan,⁸ and Webster and Hill² may be mentioned. More novel is a series of reports on the good effects of feeding cases of rickets on **Food exposed to Ultra-violet Radiations**. This plan probably originated in the observations of McQuarrie and Kugelmass⁹ that antirachitic foods, like cod-liver oil and egg-yolk, after undergoing a process of oxidation, give off ultra-violet rays. It is important to notice that Webster and Hill² repeated these experiments, and state that they "are unable to confirm their results or substantiate their claims". Further, Wagner and Wimberger¹⁰ found that rickety bones did not improve so quickly with oxidized cod-liver oil as with treatment by the crude oil. However, good reports have been published on the antirachitic power of irradiated food-stuffs by Steenbock and Daniels,¹¹ A. F. Hess,¹² S. J. Cowell,¹³ I. A. Manville,¹⁴ and others. It is a point of considerable theoretical interest, as may easily be seen.

The organization of a special clinic for the treatment of rickets with a **Mercury Vapour Quartz Lamp** in an out-patient department is the subject of a paper by E. T. Wyman and C. A. Weymuller,¹⁵ working in Boston. The results of treatment in 86 cases, controlled by skiagrams and in some instances by serum estimations, are given. The patients were exposed to the lamp at a uniform distance of 20 in. from the surface of the body. The initial treatment was 2 minutes exposure to the front and 2 minutes to the back. At each treatment the exposures were lengthened by one minute each, up to a maximum of 15 minutes each to front and back. No bad results were obtained. Evidence of improvement by radiological examination was found at the end of 2 weeks (6 treatments), and the serum-phosphate reached normal in the same time. The average length of the course of treatment was 6 to 8 weeks. The most rapid cures were obtained when the light treatment was reinforced by the administration of cod-liver oil.

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RINGWORM.*E. Graham Little, M.P., M.D., F.R.C.P.*

Cranston Low¹ carried out some experiments to obtain tests for diagnostic purposes in ringworm and favus. Extracts of the fungus from the three types were made: (1) Microsporin, from cultures of *Microsporon audouini*; (2) Trichophytin, from two types of trichophytosis; (3) Favin from *Achorion schönleini*. Skin tests carried out on the model of Pirquet's reaction were disappointing; only 8 per cent gave positive cutaneous reactions in cases of undoubted infection. The author concludes that it is not likely that fungus vaccines will be found useful in the treatment of ringworm of the scalp, either in the way of prevention or treatment.

Eczematoid Ringworm.—H. H. Hazen² finds from his personal experience and from inquiries amongst his colleagues throughout the United States that about 10 per cent of skin cases are due to ringworm infection, the largest incidence being in the three decades from 20 to 50, so that the great majority of cases are of the adult type. Indeed, it is remarkable that only 2 out of 161 cases are recorded before the age of ten. Of these 161, 100 were males. He makes the observation, which is in accord with general experience, that eczematoid ringworm is commoner in private than in hospital practice, and adds the interesting statement that labourers and negroes are almost exempt. Nearly a third of the cases had only the feet affected, and he suggests that a common source of infection is the bath mat and the floor of rooms trodden by unshod feet. The differential diagnosis lies between pompholyx, eczema, irritant dermatitis, and blastomyces. [The latter category, which must be a rare one even in the States, may be eliminated in this country.—E. G. L.] The author contends that the immense majority of cases of 'pompholyx' and 'eczema' are due to ringworm, but differentiation from irritant dermatitis is a real difficulty. The usual parasitocides are recommended, and the author has found, as other writers have also emphasized, that some cases resist all treatment.

Ringworm of Scalp in Adults.—Howard Fox and R. W. Fowlkes³ report three cases of ringworm in adult negroes. The first was a man, age 45, in whom the organism was proved by cultural tests to be *Microsporon audouini*. In the second, a negress, age 26, *Microsporon lanosum* was demonstrated. In the third case, a man, age 36, the organism was *Trichophyton niveum radians*. The authors comment on the rarity of the infection of adults in Europe and America, and quote some Japanese statistics which seem to show that adults in that country are much more commonly affected.

Ringworm of Toes.—S. H. Hulsey and F. M. Jordan,⁴ examining 100 University men, mostly medical students, in the University of Pennsylvania, found 67 unquestionably affected, and 10 doubtful. Only 23, therefore, were definitely negative. Students came there from all parts of the States, and the numbers from the East, Middle West, and the South gave an approximately equal percentage of positive results. These statistics are eloquent of the wide spread of this infection in the States.

REFERENCES.—¹*Edin. Med. Jour.* 1925, Feb., 21; ²*Jour. Amer. Med. Assoc.* 1924, ii, 1123; ³*Arch. of Dermatol. and Syph.* 1925, April, 446; ⁴*Amer. Jour. Med. Sci.* 1925, Feb., 267.

ROCKY MOUNTAIN FEVER. (*See Tick-TYPHUS.*)**RODENT ULCER.** (*See also SKIN, CANCEROUS AND PRE-CANCEROUS CONDITIONS OF.*)*E. Graham Little, M.P., M.D., F.R.C.P.*

L. Johnston¹ has used Radium in the treatment of rodent ulcers for some years, and claims that it cures 90 per cent of the lesions treated. He describes

in detail 17 cases in which complete removal of rodent tissue had been effected and no recurrence had taken place in ten years. The radium applicator used contained 100 mgrm. of radium, with a radio-activity of 1,000,000, and a nickel screen was employed.

REFERENCE.—¹*Med. Jour. of Australia*, 1924, Nov. 1, 467.

RUBELLA.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—During an epidemic of rubella, G. Lindberg¹ saw 6 cases of *polyarthritis*, 3 of which were in adults and 3 in children. In all cases acute painful joint swellings developed some days after disappearance of the eruption. In children the knees and ankles were chiefly affected, and in adults the small finger-joints. Under treatment by warmth and salicylates the symptoms subsided in one or two weeks. Other complications seen by Lindberg were acute stomatitis (2 cases), swelling of the glands at the angles of the jaw (3 cases), and a persistent febrile condition (2 cases). Like Flöystrup (see MEDICAL ANNUAL, 1924, p. 403), Lindberg saw a case of *rubella without eruption*. The symptoms were sore throat, enlargement of the mastoid and cervical glands, and a characteristic blood picture, viz., a normal number of leucocytes, with 65 per cent polymorphonuclears, 30 per cent lymphocytes, 1 per cent eosinophils, 2 per cent basophils, and 2 per cent large plasma-cells (*ibid.*). There was no fever or eruption.

A. Gans² reports a case of rubella complicated by *erythromelalgia*. The patient was his own daughter, age 8 years, who during the last few days of the incubation period developed attacks of erythromelalgia lasting for about an hour in both feet, the attacks disappearing a few days after the rash had faded. Gans suggests that the attacks were caused by the enlarged lymphatic glands pressing on the sympathetic ganglia or peripheral vasodilator fibres. This supposition was supported by the fact that the glandular enlargement was present some days before the appearance of the eruption, and was still perceptible on the day before the last attack.

REFERENCES.—¹*Acta Paediatrica*, 1924, iv, 1; ²*Nederl. Tijds. v. Geneesk.* 1925, i, 1915.

SALINE, HYPERTONIC: in Neurological Therapeutics.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Following up the experimental work of Weed and McKibben, Cohen¹ applied their method of intravenous injections of hypertonic saline to lower the intracranial pressure in six cases of inoperable cerebral tumours: 20 to 30 c.c. of a 30 per cent solution of sodium chloride were injected. Within five to ten minutes the headache disappeared, and this freedom from headache lasted from ten to forty-eight hours. In a case of meningeal syphilis, the relief lasted from six to twelve hours. The reduction of intracranial pressure is also very evident in cases of cerebral hernia following decompression for cerebral tumour. It is also a useful method for diminishing the pressure immediately before carrying out decompressive or extirpative operations in brain tumour. Even when no operation is done, this diminution of pressure gives temporary relief from headache. Macbride and Carmichael² carried out the procedure in 12 cases of cerebral tumour, 2 of which at operation were found to be endo-theliomata, the remaining 10 being gliomata. On injecting the hypertonic solution, there was an immediate burning sensation throughout the body, whilst the headache was relieved. These observers, however, found the duration of relief less than that claimed by Cohen: in none of their cases did the relief last more than thirty-six hours; hence they repeated the administration every other day. On two occasions it was given immediately before operation, and proved of undoubted value in lessening the intracranial pressure. In

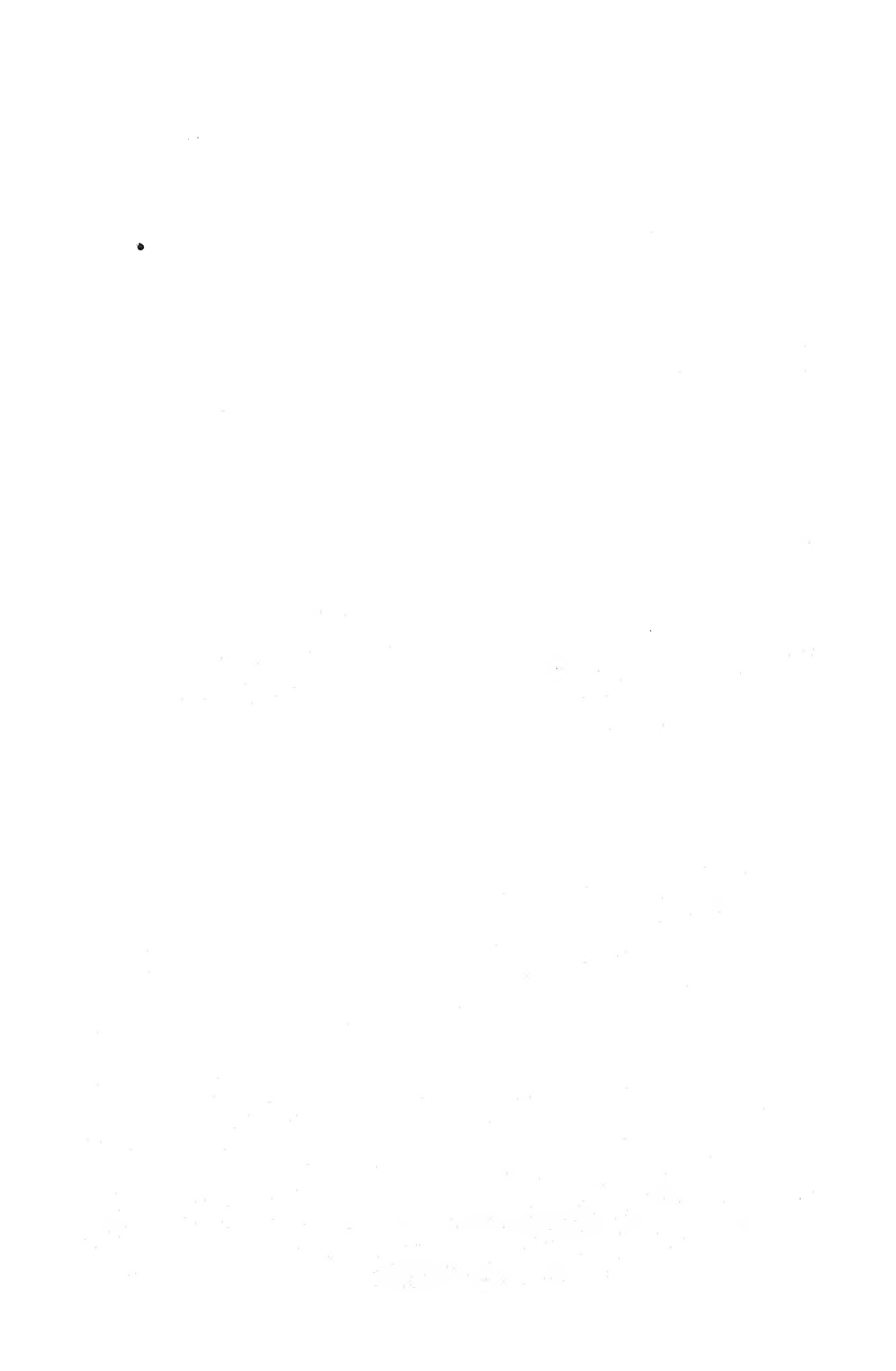


PLATE L.

SARCOMATOSIS CUTIS

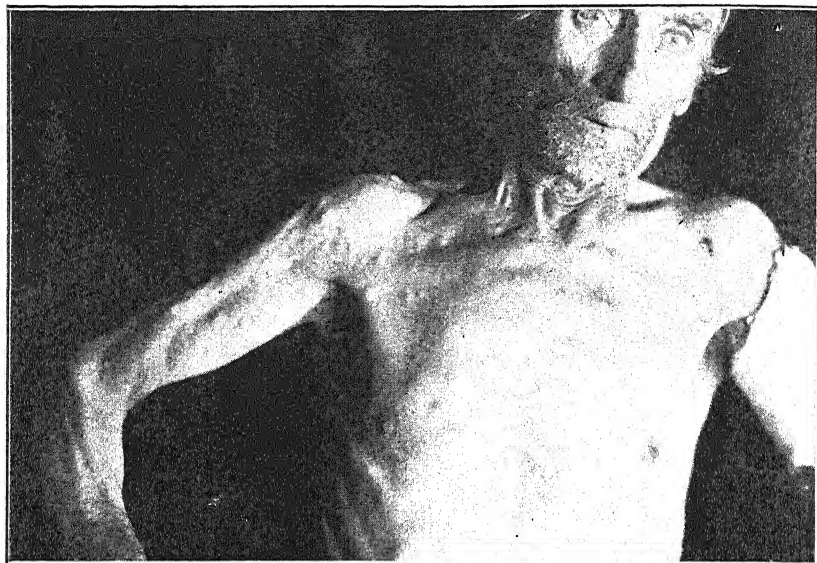


Fig. A



Fig. B

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another case it was given after the bone had been removed; the rapid diminution of pressure which ensued, allowed the dura mater to be incised without immediate bulging of brain substance and its possible subsequent damage. Subtentorial tumours, on the other hand, were aggravated as regards headache by the intravenous administration of hypertonic saline. This result is probably explained by the fact that temporary excess of salt in the blood causes increased absorption of fluid through the venules of the cortical pia-arachnoid. This relieves the pressure on the intracranial tumour, and in tumours of the cerebral hemispheres is all to the good. But when it is in the region of the cerebellum or fourth ventricle, the tumour becomes relatively larger from withdrawal of cortical fluid, and obstructs the downward flow of fluid through the iter, thereby causing hydrocephalus with its attendant headache. Moreover, owing to the risk of herniation of the medulla into the foramen magnum, administration of hypertonic saline in neoplasms of the posterior fossa is fraught with considerable danger. An acromegalic patient, without enlargement of the pituitary fossa, obtained no relief of the temporal headaches by this method of treatment; similarly the headache of two cases of pituitary tumour failed to respond.

A further extension of the usefulness of hypertonic saline is in the treatment of tabetic *gastric crises* and *lightning pains*. In four cases of severe gastric crises and in six cases of severe tabetic lightning pains the injection of hypertonic saline solution immediately arrested the crisis.

In one case of *papilloedema* which was watched for an hour following the intravenous injection of the solution, the height of the swelling fell within six minutes from + 5 D to + 3 D, and only returned to + 5 D twelve hours later.

REFERENCES.—¹*Brit. Med. Jour.* 1924, i, 420; ²*Lancet*, 1924, ii, 959.

SARCOMATOSIS CUTIS.

E. Graham Little, M.P., M.D., F.R.C.P.

Sarcomatosis Cutis (Spiegler).—Under this category a rare form of sarcoma of the skin, excluding metastatic extension from visceral or bone foci, and capable of spontaneous involution, is considered by S. E. Sweitzer,¹ who records a new case, in a man, age 69, who showed a number of skin tumours, of a week's duration, chiefly on the chest and arms (*Plate L, A*). Over 150 such tumours were counted, covered for the most part by normal skin, but in a few instances the overlying skin was bluish. They varied in size from that of a pea to that of a plum. Some were movable with the skin; most of them were not attached to the skin. All the glands were slightly enlarged. A nodule was excised and examined, and found to consist of a cellular mass lying in the subcutis, the cells on higher magnification resembling those of a round-celled sarcoma. All the nodules disappeared after radiation by X Rays (7-in. spark-gap, 5 ma., 10-in. distance, 3-mm. aluminium filter, time 5 minutes). A year later the tumours had recurred, and again disappeared under treatment by Arsenic by the mouth. Recurrence again took place, the patient wasted, and died within a year of the first onset.

Idiopathic Multiple Pigmented Sarcoma (Kaposi).—G. J. Dillard and F. D. Weidman² report 2 cases under this heading, in one of which the very remarkable discovery was made of fungus in the hæmorrhagic nodules of infected lymph glands. The first case, a Russian Pole (? Jew), age 66, had had typical hæmorrhagic sarcoma of the legs for five years. Various treatment (including prolonged X rays) was tried, without effect; and the patient died a year after admission. Smears from scrapings and sections of the skin, examined for organisms, proved negative. The blood-count was fairly normal. The second case, an Irishman, age 82, showed very numerous hæmorrhagic nodules on the ankles, knees, back of the hands (*Plate L, B*), legs, and thighs. The skin

over both shins was thin, diffusely and deeply pigmented, but without obvious nodules. The patient died of acute bronchopneumonia. Sarcomatous growths were found in the bladder, stomach, and intestine, with general enlargement of glands, especially of the gastro-intestinal tract.

The skin, histologically, was similar in both cases, and did not in any way support the diagnosis of sarcoma. The essential character described by the authors is a hyperplasia of endothelium, with very early dilatation of lymphatic spaces, and a certain degree of collagenous degeneration. From the mesenteric glands preparations were made which showed mycelial constituents in giant cells. These findings were limited to the gastro-hepatic and mesenteric glands, and were absent from glands examined from the neck and inguinal region. Fungus has never been found in any previously reported instance of Kaposi's disease. No culture of the fungus was possible. Its morphological characters resembled favus. The authors comment on the circumstance that Kaposi's disease is common amongst Russian Jews and Italians, who are also very widely subject to favus. They consider the possibility of the fungus being an exceptional invasion in their second case; and record the observation, without pressing the argument, "that the fungus may be one cause of Kaposi's disease".

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1925, April, 481; ²*Ibid.* Feb., 203.

SCABIES.

E. Graham Little, M.P., M.D., F.R.C.P.

D. W. Montgomery¹ has a useful suggestion for demonstrating the acarus more easily than by the traditional method of fishing it out with a needle. The way is to take up a fold of the skin, with the burrow running along the summit of the fold, and with a scalpel to shave off a thin slice of epidermis containing the burrow; then to lay the slice bottom side up in glycerin on a glass slide, place over it a cover-glass, and examine with a low-power lens. The acarus is usually included in the slice; and there will almost certainly be eggs and feces, which are equally conclusive evidence of the presence of the parasite. Many cases, especially in private, are so well cleansed that the burrow is difficult to find. The feat may, in these instances, be a more successful venue.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Oct., 473.

SCALP, DISEASES OF.

E. Graham Little, M.P., M.D., F.R.C.P.

TREATMENT.—A. M. H. Gray¹ considers the *scurfy diseases of the scalp* under two headings: (1) A dry form, pityriasis simplex; and (2) Pityriasis steatoides, a moist or greasy form. The former is usually regarded as due to infection by the bottle bacillus, but it may be the product of mere deficiency of normal oily secretion, and treatment will vary according as to which variety is present. The best differentiation is the presence of dryness of the skin in other parts. Cases in which the oily secretion is defective are best treated with oily lotions, and too frequent washing of the scalp is obviously contraindicated. In the bacterial cases, and those in which greasy secretions are abundant, frequent washing is desirable, two or three times a week in men and once a week in women. The liquid extract of quillaia is a good shampoo lotion, but any good soap may be used.

Useful formulæ for these conditions are the following: For the dry varieties where bacterial causation may be suspected, antiseptics should be added to the application, e.g. :—

R Resorcini
Spt. Coloniensis

3j	|	Ol. Ricini
3j	|	Aq.

3ij
ad 3viii

Resorcin should not be used in persons with fair hair, and hydrarg. perchlor.

gr. 2 or chloral 1 drachm may be substituted. In more severe cases an ointment is better than a lotion, and this formula is advised :—

R	Acid. Salicyl.		Paraffin. Moll.	$\overline{3}ij$
	Sulph. Sublim.	\overline{aa} gr. xv	Ol. Coccois Nuciferae	ad $\overline{3}j$
	Ol. Lavand.	\overline{lliv}		

Pityriasis steatoides is merely an exaggerated form of the bacterial type of pityriasis simplex, with added exudation. [Darier regards it as a mild eczematide.—E. G. L.] A good formula for an ointment for use in this condition is :—

R	Anthrasol	gr. xx	Paraffin. Moll.	$\overline{3}ij$
	Acid. Salicyl.	gr. v	Ol. Coccois Nuciferae	ad $\overline{3}j$

In the more acute cases of this type there may be weeping and crusting, and redness of the scalp, as well as scaling. Soaps are here contra-indicated, and bathing with warm alkaline water is advised (e.g., by adding a teaspoonful of washing soda to a washhand basin of warm water). When crusts are present, starch poultices are useful. In acute cases, linimentum calcis, with 1 gr. of hydrarg. perchlor. to 8 oz., may be used, or sulphur or salicylic acid may be substituted for the mercury if this proves too irritating. Where there is no inflammation, oily scalpings may be treated by frequent washing and by the application of the following lotions :—

R	Resorcini	$\overline{3}j$	Spt. Vini Rect.	$\overline{3}ij$
	Acid. Acet.	$\overline{3}ss$	Aq. Rosæ	ad $\overline{3}viij$
	Hydrarg. Perchlor.	gr. ij	Spt. Vini Rect.	$\overline{3}ij$
	Sp. Coloniensis	$\overline{3}j$	Aq.	ad $\overline{3}viij$
	Liq. Calcis Sulphuratæ (B.P.C.)		Aq.	ad $\overline{3}viij$
	Glycerin	\overline{aa} $\overline{3}j$		

Loss of hair, apart from the baldness due to acute illness or to local disease of the scalp, may be roughly grouped in two classes : (1) Calvities, only found in the male, and seen as a progressive baldness commencing on the crown and frontal region, and invading the top of the head ; (2) General thinning of the hair, which is frequent in women after the age of thirty. To combat these changes (and the condition is often hereditary), attention to the scalp should be begun at an early age, and should comprise weekly washing of the head, the hair being kept fairly short. When loss is excessive, lotions such as the following may be rubbed into the scalp :—

R	Acet. Cantharid.	$\overline{3}ij$	Spt. Vini Rect.	$\overline{3}iss$
	Spt. Coloniensis	$\overline{3}ss$	Aq.	ad $\overline{3}viij$

Pilocarpine is claimed to have a specific action, and may be used as follows :—

R	Pilocarpin. Nit.	gr. xx	Alcohol (60 per cent)	ad $\overline{3}viij$
	Spt. Rosmarin.	$\overline{3}ss$		

The author utters a needed word of warning against the vogue of vibromassage, high-frequency treatment, and ultra-violet light, all of which have been unscrupulously exploited.

REFERENCE.—¹*Lancet*, 1921, ii, 33.

SCARLET FEVER.

J. D. Rolleston, M.D.

BACTERIOLOGY.—G. F. and G. H. Dick¹ state that morphologically the streptococci of scarlet fever are not distinguishable from streptococci from other sources. They have no characteristic staining nucleus, and the appearance of the colonies on blood-agar plates is too variable to furnish a means of differentiation. On the other hand, a study of the toxin production of hæmolytic streptococci affords a means of recognizing those organisms which are

capable of producing scarlet fever, details of which are given. In uncomplicated cases of scarlet fever the hæmolytic streptococci usually disappear from the nose and throat during convalescence, but the specific streptococcus may be cultivated from the discharges obtained from the sinuses, glands, and middle ears after the patient has been released from quarantine.

Bürgers² examined 330 specimens from 35 acute cases of scarlet fever,^{*} but was unable to find the diplococcus described by Di Cristina and Caronia as the causal organism of scarlet fever. S. Meyer,³ as the result of a year's study of the diplococcus in question, concludes that it is no specific for scarlet fever. The same changes in the medium and the same diplococci in the blood were found after inoculation of the medium with the blood and cerebrospinal fluid of varicella, rubella, and chorea patients as well as with the blood of healthy subjects.

SYMPTOMS AND COMPLICATIONS.—H. W. Traub⁴ discusses the clinical course of *scarlet fever in twins*, having had the opportunity of observing cases in two sets of twins and in one member of another pair. The first set was one of non-identical twins who showed an astonishing difference in the intensity of their clinical symptoms, one having a mild, and the other a very severe, attack. In the second set of twins, who were identical children, the diseases assumed a very mild form in both. In a third dissimilar pair, age 5 years, each one of whom was exposed to infection, only one contracted the disease.

G. E. Learmouth⁵ records a case of *gangrene of the lower extremities* in a male infant, age 2 years and 11 months, suffering from scarlet fever complicated by otitis media and nephritis. The gangrene, which was moist, involved all the left foot as well as the dorsum of the right foot and toes, and a strip across the plantar surface proximal to the toes. No attempt was made to amputate, but the distal portion of the left foot sloughed off at the tarsometatarsal joints, and all the toes of the right foot separated at the metatarsophalangeal articulation. The child recovered, and was able to walk with padded feet, though with considerable difficulty. [The rarity of this complication, of which the reviewer has never seen an example among many thousand cases of scarlet fever in the course of twenty-five years, is to be attributed to the fact that embolism and thrombosis, either of which may give rise to the condition, are both very uncommon in scarlet fever.—J. D. R.]

Secondary rashes in the form of an urticarial, maculopapular, papular, or pityriasisiform eruption, to which J. Kleeberg⁶ and G. Fanconi⁷ have recently drawn attention, are a frequent occurrence in convalescence, though they have received little notice in most text-books. The rashes may be generalized, but the sites of predilection are the extremities, especially the buttocks, knees, and elbows. Unlike the blotchy or circinate eruptions associated with septic scarlet fever, these late rashes are not accompanied by any involvement of the mucous membranes, rise of temperature, or constitutional disturbance of any kind. The frequency of these eruptions is shown by the fact that Kleeberg noted them in 42 out of 115 patients. Age and sex were of no etiological significance, as the rashes were found at all ages and in both sexes, although they were commoner among obese subjects. The rashes never appeared before the end of the first week, but were usually first noticed at the end or middle of the second, lasting as a rule five to eight days, and at most ten days.

P. N. Mutschmann⁸ remarks that, while *facial paralysis* complicated by suppurative otitis media and cerebral abscess is not rare, he has found only one previous case on record of peripheral involvement of the facial nerve due to a parotid abscess unaccompanied by otitis media. He now reports two cases, in a boy, age 8, and a girl, age 9, of unilateral peripheral facial paresis

which followed attacks of scarlet fever with only a moderate degree of glandular involvement. In each case there were enlargement of the right parotid gland, and a purulent discharge from the duct without any change in the salivary secretion. The issue of the case is not recorded. C. I. Urechia and S. Michalescu⁹ report a case of *complete paralysis of the brachial plexus* on the right side following cellulitis of the arm, occurring in the second week of scarlet fever. When the patient was seen three months after the onset of scarlet fever, the right upper limb was completely paralysed and atrophic, and showed complete reaction of degeneration. The tendon reflexes were abolished. Sensibility was intact. Much improvement took place after three weeks' electrical treatment.

V. Markovitch and M. Gueratovitch¹⁰ made a study of *eosinophilia* in 30 cases of scarlet fever, and conclude: (1) The eosinophil reaction in scarlet fever depends upon the clinical form of the disease. It reaches its maximum in mild forms of uncomplicated scarlet fever, while in severe forms accompanied by complications the eosinophilia is low during the acute stage and the presence of complications, but as the general condition improves there is a rise in the eosinophil curve. In every septic attack which ends fatally eosinophils are absent or reduced to their normal values owing to the organism being deprived of its power to react. (2) In incomplete forms (*formes frustes*) of scarlet fever, eosinophilia is an important diagnostic element, whether it be found at the onset or in the later stages of the disease. (3) In erythema scarlatiniforme the eosinophil count is normal.

The Dick Test.—Numerous writers, such as W. E. Gatewood,¹¹ O. B. Nesbit,¹² E. S. Platou,¹³ A. F. Robertson,¹⁴ and A. Zingher¹⁵ in the United States, C. B. Ker, J. E. McCartney and J. McGarrity,¹⁶ C. C. Okell, and H. J. Parish¹⁷ in Great Britain, J. Paraf¹⁸ and C. Zoeller¹⁹ in France, and P. S. Rosen and L. A. Korobicina²⁰ in Russia, testify to the value of the Dick reaction (*see* MEDICAL ANNUAL, 1925, p. 386) both as an indication of immunity or susceptibility to scarlet fever, and as a diagnostic aid in doubtful cases. It is noteworthy that Ker and his collaborators found that only 73 per cent of their scarlet-fever patients tested in the first three days of the fever gave a positive reaction, as compared with 100 per cent in Zingher's statistics. They attributed this result to weakness of the toxin, faint or doubtful reactions having little chance of being detected against the background of a brilliant scarlet-fever rash. Rosen and Korobicina, on the other hand, who found that the Dick reaction was positive in only 82.5 per cent during the first few days of the disease, attribute the comparatively low percentage to the mild character of the epidemic in Moscow, where their investigations were made.

PROPHYLAXIS.—G. F. and G. H. Dick²¹ state that the passive immunity conferred by prophylactic doses of scarlet-fever antitoxin is immediate but transient, lasting only from four to eight weeks. On the other hand, the active immunity produced by injections of scarlet-fever toxin in graduated doses is acquired less promptly but is more permanent, immunity developing in one or two weeks. After alluding to Sindoni's results obtained by inoculation with Caronia's Vaccine of 293 persons exposed to scarlet fever, when all escaped the disease except one infant who was in the incubation stage before inoculation, M. Gioseffi²² records his own observations in a school attended by 98 children, of whom 11 had developed scarlet fever. The remaining 87 were inoculated with Caronia's vaccine, intragluteal injections of 2 c.c. of the vaccine being given for three consecutive days, and none contracted the disease. T. Lazzarini²³ also inoculated 70 children and G. de Toni²⁴ 41 children who had been exposed to scarlet fever, without any of them contracting the disease in spite of their deplorable hygienic surroundings.

TREATMENT.—K. E. Birkhaug²⁵ made comparative observations on the use of Convalescent Scarlet-fever Serum and Dochez's Scarlatinal Antistreptococcal Serum in the treatment of scarlet fever, with the following results: (1) 37 patients suffering from severe attacks were treated during the first seven days of the disease by intramuscular injections of 15 to 85 c.c. of serum from convalescent cases. In only 9 cases was more than one dose given. A rapid improvement took place in the general symptoms, and there was a slight fall in the temperature and pulse-rate, but the treatment had no effect on the general rash, nor did it shorten convalescence or reduce the incidence of septic complications in convalescence. (2) On the other hand, intramuscular injection of Dochez's scarlatinal antistreptococcal serum in doses of 40 c.c. during the first three days of the disease caused a prompt disappearance of the toxæmia, a critical fall in temperature and pulse-rate, prompt fading of the eruption, rapid reduction in leucocytosis, and rapid disappearance of the glandular enlargement. The incidence of septic complications was low in cases treated with Dochez's serum prior to the fourth day of disease. The action of the serum, however, on septic complications was slow and irregular. Excellent results from the use of Dochez's serum are also reported by C. L. Thenebe,²⁶ who employed it intravenously in 22 cases. Only two complained of a chilly sensation during or after injection. None developed a frank chill, and only four had a serum rash. The superiority of Dochez's serum over the serum of convalescents from scarlet fever is doubtless to be attributed to the fact that the treatment by scarlet-fever convalescents' serum is, as T. Pontano²⁷ shows, not really specific, but a form of protein therapy, equally good results being obtained by injecting serum of normal individuals and normal horse-serum.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 802; ²*Centralt. f. Bakteriol.* 1924, xciii (Orig.), 220; ³*Monats. f. Kinderh.* 1925, xxix, 524; ⁴*Arch. of Pediatrics*, 1924, 638; ⁵*Canad. Med. Assoc. Jour.* 1925, 69; ⁶*Zeits. f. Kinderh.* 1924, xxxviii, 577; ⁷*Jahrb. f. Kinderh.* 1924, cvii, 18; ⁸*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1633; ⁹*Arch. de Neurol.*, 1925, xlv, 35; ¹⁰*Presse méd.* 1925, 205; ¹¹*Jour. Amer. Med. Assoc.* 1924, lxxxiii, 494; ¹²*Ibid.* 1925, lxxxiv, 805; ¹³*Minnesota Med.* 1925, 285; ¹⁴*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1801; ¹⁵*N. Y. State Jour. Med.* 1924, 915; ¹⁶*Lancet*, 1925, i, 230; ¹⁷*Ibid.* 712; ¹⁸*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1925, 395; ¹⁹*Ibid.* 1924, 1697; ²⁰*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1476; ²¹*Ibid.* 1477; ²²*Riforma Med.* 1924, 968; ²³*Policlinico*, 1925 (Sez. Prat.), 595; ²⁴*Ibid.* 840; ²⁵*Johns Hop. Hosp. Bull.* 1925, 134; ²⁶*Boston Med. and Surg. Jour.* 1925, xciii, 937; ²⁷*Policlinico*, 1925 (Sez. med.), 265.

SCHISTOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—D. B. Blacklock and M. G. Thompson¹ have inquired into the prevalence of this disease in Sierra Leone, and found only *S. haematobium* present, the intermediate host of which proved to be the *Physopsis c.f. glabosa*, Morelet; the infection rate of this in a water latrine was no less than 42 per cent, while this snail proved unexpectedly resistant to drying, which it survived for a fortnight. They concluded that the local conditions precluded any attempt to deal with the disease by intensive treatment, and advised attacking the snail where it is known to be infected, and sanitary education. They consider that the different pathogenic schistosomes cannot be classified by their cecarial stage, and are doubtful if their intermediate snail hosts will serve to separate them. A. H. Hall,² at Basra in Iraq, found 47 per cent of 711 children to be infected with *S. haematobium* through bathing in tidal-affected irrigation creeks and channels; the infections increasing up to 9 years but decreasing after the age of 12 years. All races were affected—Mohammedans most so, Europeans very little. The physical development and to a less extent the intelligence of those infected were retarded, although the disease was comparatively mild. The expense of disinfecting the bathing-places is prohibitive, but some good results were obtained with antimony treatment.

B. H. H. Spence³ reports the successful results of a campaign to eradicate helminthiasis, and especially schistosomiasis, from first the recruits and later the soldiers of the Egyptian army. This first led to opposition, but eventually was acknowledged by the objectors to have produced fitter recruits than ever seen before, while the evidence showed that 95 per cent of the worms were killed by the Antimony Tartrate treatment. Previously 14 per cent of the hospital cases and 29 per cent of the invaliding were due to helminthic diseases, including anylostomiasis, which was also dealt with at the same time. C. G. K. Sharp,⁴ in Natal, finds the coastal area, especially at the mouths of the rivers, to be most severely affected, while very few of the natives ever come under European medical treatment. The disease is common among school children, including Europeans. Eosinophilia is most marked during the first few months of the infection. He recommends the maintenance of ducks on the infected waters and storing for forty-eight hours any suspected water before consumption. F. G. Cawston⁵ finds Indians frequently infected in S. Africa, and considers they may possibly carry the disease to India on their return. R. B. Lal⁶ has tried the aldehyde blood test in cases of *S. haematobium*, but only obtained partial reactions in a few cases. A. Felix⁷ describes vesical bilharziasis in Palestine, in light cases which urinary examinations often failed to detect. Antimony gave good results, but he failed to cure any cases with emetine. W. H. Dye⁸ describes an intense focus of *S. mansoni* and *haematobium* in a ten-mile-wide flat strip to the east of Lake Nyasa, with greatly contaminated watercourses. The carrier of *S. mansoni* was found to be *Planorbis* sp., var. *sudanicus*, Martens, and that of *S. haematobium* to be *Melania nodocincta*, Dohrn. Marked enlargement of the liver and spleen were the most evident clinical features, especially in the commonly infected children, and eosinophilia was well marked. In one fatal case much fibrosis of the liver was present. Good results were got in all but very advanced cases with the usual antimony treatment.

TREATMENT.—J. B. Christopherson⁹ criticizes N. H. Fairley's conclusion from experiments on goats that emetine is more efficient than antimony in killing schistosomes in man (see MEDICAL ANNUAL, 1925, p. 388), and points out that in some of his animals insufficient doses of antimony were given, while he doubts if goat results are necessarily applicable to man. F. G. Cawston¹⁰ reports one case in which both antimony and emetine were used, with no more rapid cure than with antimony alone.

Schistosomiasis Japonica.—H. E. Melency, E. Carrol Faust, and C. McA. Wassell¹¹ describe intensive antimony treatment under hospital conditions of this disease at Wuchang in the Mid-Zangtze region in 7 cases of moderately advanced disease in boys with enlarged livers and spleens, but no ascites, that late symptom being a sign that the case is too advanced to stand a curative antimony treatment. One boy ran away when believed to be cured, and the rest were discharged (?) cured after the injection of a total of about 2 gm. of Tartar Emetie in the course of sixty days, which time was required to give this amount without toxic symptoms. The last egg disappeared from the faeces after an average dose of 1.2 gm., but control hatching of miracidia was not stopped until an additional average of 0.34 gm. had been given in forty-four days, showing this to be the more reliable test; but it is suggested that an average of 1.5 gm. in forty-five days may prove sufficient to bring about a cure in this stage of the disease. The spleens and livers were reduced to some extent, the general physical health improved greatly, and the blood picture became more normal. They therefore advocate this treatment in incipient and moderately advanced cases whenever the patients can be induced to undergo the full course required for success.

J. P. Cullen¹² reports the occurrence of *S. japonica* in the Shan States of Burma bordering on Chinese territory; he obtained disappearance of the ova from the stools and reduction of the liver to normal size after 12 gr. of tartar emetic, although he is not prepared to say the patient was cured; the remaining cases were in the advanced ascitic stage unamenable to treatment. He points out the danger of its spread in Indian territory.

REFERENCES.—¹*Ann. of Trop. Med. and Parasitol.* 1924, Aug. 2, 211 and 235; ²*Jour. R.A.M.C.* 1925, Feb., 92; ³*Ibid.* May, 322; ⁴*S. Afric. Med. Record*, 1925, Oct. 25, 571; ⁵*Jour. Trop. Med. and Hyg.* 1925, May 15, 193; ⁶*Ind. Med. Gaz.* 1924, Nov., 560; ⁷*Amer. Jour. Trop. Med.* 1925, Jan., 41; ⁸*Jour. R.A.M.C.* 1924, Sept., 161; ⁹*Ind. Med. Gaz.* 1925, March, 108; ¹⁰*Jour. Trop. Med. and Hyg.* 1924, Nov. 1, 283; ¹¹*Ibid.* 1925, April 1, 153; ¹²*Ibid.* 1924, Dec. 15, 337.

SCIATICA.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

During recent years innumerable treatments have been suggested for the relief of obstinate sciatica, of which the most efficient seem to be those by means of injections either into the nerve-trunk itself, around the nerve (i.e., into its sheath) or into the epidural tissues within the sacral canal through which the roots of the nerve run before uniting to form the nerve-plexus and then the nerve-trunk.

Lange's treatment by massive injections—of 100 c.c. or more—of Normal Saline Solution into the nerve-trunk has had a wide vogue, and many cases have been relieved by this method. Similar injections of normal saline solution, 10 c.c. at a time, have also been injected epidurally, through the sacrococcygeal gap, and are specially indicated where the sciatica is of a radicular type. In 1922 Höglér,¹ of Vienna, introduced the method of epidural injection of 10 c.c. of a 40 per cent solution of Antipyrin, and claimed better results than from the simple saline solution. Jordan,² of Heidelberg, records 29 cases treated in this manner during the last two years, and considers the technique much less uncomfortable for the patient. After a preliminary hypodermic injection of morphine or morphine-scopolamine half an hour beforehand, the site of puncture through the sacrococcygeal membrane is disinfected, and a local anæsthetic such as a hypodermic of novocain is given. Then, with the patient in the knee-elbow position, the injection needle is introduced, practically painlessly, along the sacral canal for a distance of 8 or 10 cm. The antipyrin solution is then injected, and the patient made to rest on his back for an hour or two. The pain ceases almost immediately on completion of the injection. Sometimes there is a slight recurrence on the first or second day, but this is readily calmed by the administration of an analgesic drug such as veramon by the mouth. In rare cases it was necessary to repeat the epidural injection after a week, to produce complete and permanent relief. If, in spite of this, a few pains in the calf muscles still persist, Jordan recommends injecting the nerve-trunk with novocain solution. It is curious, to say the least, to note that Höglér³ himself, in a later communication of the present year, 1925, seems to select the nerve-trunk for his antipyrin injections rather than the epidural route. His solution is a 30 to 50 per cent solution of antipyrin. To 10 c.c. of this he adds $\frac{1}{2}$ to 1 c.c. of a 1 per cent solution of novocain. This is delivered by a long puncture needle, not into the substance of the nerve-trunk but into the perineural tissues. The needle point is pushed in until the nerve is reached, this being recognized by the patient feeling a characteristic stab of pain down the limb into the toes. The needle is then slightly withdrawn, and the fluid injected into the surrounding tissues. Höglér records in detail three obstinate cases successfully treated in this way, after failure with other methods, including massive perineural injections of normal saline solution.

Rosenheck and Finkelstein,⁴ of New York, confidently discard all the injection methods as inefficient, and emphatically declare their opinion that the vast majority of cases of sciatica are due to inflammation or injury of the corresponding sacro-iliac joint. They go so far as to call it 'orthopædic sciatica', and carry out a treatment, first suggested by Baer⁵ and Coffield,⁶ which consists in energetic, not to say violent, **Stretching of the Nerve**. The patient, who is under a general anæsthetic, is laid on his back on a solid immovable table. Two assistants firmly hold the pelvis down. The operator grasps the unaffected limb with one hand in front of the knee and the other above the heel; gradually increasing force is then applied in an antero-posterior plane, all rotatory movements being scrupulously avoided. This force is continued until the hamstring tension which is usually present is overcome. Then the affected limb is grasped in similar fashion, when it will be found that the hamstrings are in a state of marked contraction. Force is now applied, always in the antero-posterior plane, until the toes are approximated to the shoulder of the same side. Usually a distinct 'click' is heard, which is a signal that the muscles have been sufficiently stretched. These workers think this click is due to sudden tearing of the hamstring muscles near their attachment, for they have observed large ecchymotic areas both at the origin and insertion of the hamstrings after this manipulation. Following this complete stretching, the patient is now turned face downwards across two tables about three feet apart, one assistant steadying the legs, another the shoulders. The operator then forces the lumbar vertebrae into a posture of complete hyperextension, and pressure is exerted over the affected sacro-iliac joint. The patient is at once placed in a plaster jacket from the mid-dorsal region down to the great trochanters, the hyperextension being maintained by two bent steel rods. When the plaster is hardened, the patient is returned to bed. The plaster case is worn for about two weeks, followed by a plaster jacket or a sacro-iliac corset to be worn for at least a year, during which treatment is continued in the form of baking, massage, and exercise. All this sounds rather heroic, and when we read that Baer claims that in 100 cases immediate relief was obtained in almost every instance, there being only three relapses, one cannot help wondering whether the picture has not been painted in too rosy colours. Rosenheck and Finkelstein give no details of their cases, nor of their number, but content themselves by stating that their observations show favourable results in all cases due to static disturbances or traumatic lesions of the sacro-iliac joints. They admit that this drastic manipulative treatment is unsuitable for cases due to inflammation of the sacro-iliac or lumbo-sacral joint, or to disease of the vertebrae. They also mention incidentally, in the last lines of their article, that they have twice produced traumatic paralysis of the sciatic nerve, probably due to rupture.

REFERENCES.—¹*Wien. klin. Woch.* 1922, 974; ²*Münch. med. Woch.* 1925, April 3, 560; ³*Wien. klin. Woch.* 1925, Jan. 15, 94; ⁴*Jour. Amer. Med. Assoc.* 1925, March 21, 939; ⁵*Johns Hop. Hosp. Bull.* 1917, May, 169; ⁶*Amer. Jour. of Orthopædic Surg.* 1918, Nov., 418.

SCLERODERMIA.

E. Graham Little, M.P., M.D., F.R.C.P.

Janichewski¹ reports excellent results in the treatment of two cases of scleroderma with **Ultra-violet Rays**, by means of the quartz lamp, applied over the thyroid gland as well as on the actual sclerodermic areas. It was found subsequently that the treatment of the thyroid gland could be omitted, the radiation being applied directly to the affected areas. A patch upon the scalp in the first case even grew normal hair after treatment.

REFERENCE.—¹*Presse méd.*, 1925, June 27, 863.

SCLEROSIS, DISSEMINATED.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

That disseminated sclerosis is a disease of microbic origin is now almost universally admitted by neurologists. Unfortunately, so far, its causal organism has not yet been identified, and until this has been accomplished we have neither a specific vaccine nor a specific antitoxin at our disposal. An obvious difficulty in estimating the true therapeutic value of remedies in disseminated sclerosis is the well-known tendency for this disease to undergo spontaneous remissions, and the natural human inclination of the physician to ascribe the occurrence of a remission to the treatment which the patient happened to be receiving at the time.

The two therapeutic methods which, up to the present date, have yielded the most satisfactory results are the pyrexial treatment by progressively increasing doses of Typhoid Vaccine, and treatment by a course of Salvarsan or Silver-salvarsan injections. Siemerling¹ has recommended the addition of Calcium Chloride to the neosalvarsan injections, the total amount of the neosalvarsan in a course being 3 grm. distributed over 15 injections, an average of 20 cgrm. at each injection. Siemerling gives an injection of calcium chloride before each dose of neosalvarsan. More recently Schacherl² has combined the pyrexial (or typhoid vaccine), the neosalvarsan, and the calcium chloride treatments in a series of 87 cases of disseminated sclerosis at the University clinic in Vienna. At first his patients had five injections per week, two of typhoid vaccine, two of calcium chloride, and one of neosalvarsan—a busy programme where a large number of patients had to be treated. Later he modified it by dissolving the neosalvarsan in the calcium chloride solution (10 c.c. of a 10 per cent solution), and also gave the typhoid vaccine mixed with the calcium chloride, thereby reducing the number of intravenous injections to two a week. The typhoid vaccine begins with a dose of 25 million, and is progressively increased to a maximum which is not stated in his records. Eleven injections of calcium chloride and vaccine, alternating with 11 of neosalvarsan dissolved in calcium chloride, are given, 22 injections in all, spread over a period of eleven weeks. The first dose of neosalvarsan is 15 cgrm., the second 30 cgrm., and the remaining nine are each 45 cgrm., a total of 4.5 grm. in all. The addition of calcium chloride entails one or two minor discomforts, but even the most sensitive patients quickly become accustomed to them. One is a feeling of intense glowing heat which immediately follows a calcium chloride injection; the other is the disagreeable nauseous taste which the patient experiences after a calcium-neosalvarsan injection.

The results of such treatment may be summarized as follows, it being noted that none of the cases had been under observation for longer than eight months. The patients treated numbered 64: 48 women and 16 men. Of the 64, 40 were much improved, and 6 of these became free from symptoms; 16 were improved; and 8 showed no improvement. The older the patients and the longer the previous duration of the disease, the less favourable were the results. Schacherl's definition of 'freedom from symptoms', a result attained in 6 cases, means that the patients felt subjectively well and had no objective motor disorder such as ataxia or intention-tremor; nevertheless the abdominal reflexes were still abolished, and although clonus and extensor plantar reflexes were absent, the deep reflexes were still exaggerated. By 'much improved' he explains that these are patients in whom the severe motor disturbances had cleared up, so that the gait was definitely better, but slight ataxia still persisted, together with the clonus and an extensor plantar response. Cases described as 'improved' were those in whom the spasticity and ataxia persisted, although in lesser degree than before treatment, whilst bladder troubles,

cerebellar symptoms, and such like had disappeared. The rapidity with which these remissions set in, especially in recent cases, in young people, is sometimes remarkable. Recent cases with symptoms mainly of cerebellar type are specially favourable. Bladder troubles and diplopia clear up fairly quickly, and also the slighter degrees of ataxia. Nystagmus and the extensor plantar response diminish much more rapidly than ankle-clonus.

REFERENCES.—¹*Wien. klin. Woch.* 1924, No. 15; ²*Ibid.* 1924, Oct. 2, No. 40, 1037.

SCROFULODERMA GUMMOSA. *E. Graham Little, M.P., M.D., F.R.C.P.*

This term, H. E. Michelson¹ suggests, should be confined to a nodular type of cutaneous tuberculosis, which begins in the deeper layers of the skin as a circumscribed node that softens, perforates, and forms ulcers. The process thus resembles a gumma, and Besnier's name of 'scrofulous gumma' should be retained. Children are more frequently affected than adults, the sites of infection being the skin overlying tuberculous glands, bones, or joints. In adults, the face and neck and epiphysial regions are most commonly involved. The condition may occur, but is rare, upon mucous membranes. The overlying skin may become discoloured to a vivid red or purplish hue; and pus develops only after long periods of evolution. The differentiation between tuberculosis and syphilis in these cases is difficult; and the Wassermann reaction, tuberculin, and animal inoculations help in the differentiation. From sporotrichosis, the arrangement along the lymphatics, the acute onset, the crater-like superficial elevated lesions, and cultural findings are diagnostic. For treatment, X Rays, Light Treatment, and Tuberculin are recommended, combined with general treatment for tuberculosis.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Nov., 561.

SENILE SKIN. (See SKIN, SENILE.)

SEPTICÆMIA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

D. Hinton¹ recommends the intravenous use of a 1 per cent sterilized solution of Gentian Violet in distilled water in early cases of extreme septicæmia. The patient's weight was estimated, and approximately 23 c.c. of the solution per 100 lb. was used. Within three minutes after the injection in all cases there was a generalized cyanotic colour, most marked in the mucous membrane. The colour faded out within two to four hours. There was no reaction. Eleven cases in which the method was tried are briefly recorded. No definite conclusions were drawn, but there was a well-marked clinical improvement in four. The injection seemed to do no harm, and further trial may bring about increase of its sphere of usefulness.

REFERENCE.—¹*Ann. of Surg.* 1925, March, 687.

SERUM DISEASE.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—Among the less-known manifestations of the serum disease to which reference was made in last year's MEDICAL ANNUAL, p. 398, are *generalized adenitis*, of which cases are reported by Leconte and Yacoel¹ (after administration of antigangrene serum), P. Vallery-Radot² and Vadier³ (after diphtheria antitoxin), and by Ionesco and Craciuc⁴ (after antistreptococcus serum); *polyneuritis*, of which examples are described by P. Sainton, P. Descouts, and R. Leclerc,⁵ and Souques, Lafourcade, and Terris⁶; *orchitis*, of which cases are recorded by Guinon and Lamy⁷ and by E. W. Goodall⁸; and *abdominal pain*, which was associated with orchitis in Goodall's case. [Within the last year the reviewer has also seen an unusual number of cases of severe abdominal pain, sometimes associated with diarrhoea

and vomiting, occurring at the time of the serum rash after injection of diphtheria antitoxin. The symptoms, however, soon subsided without any operative interference being required.—J. D. R.]

Another very rare serum phenomenon is that described by E. Fischer,⁹ who records two cases of *death of the fetus* due to serum sickness of the mother, who had been injected with antistreptococcus vaccine and serum for pyæmia at the end of pregnancy. In the first infant, who was born dead, the necropsy showed only petechial hæmorrhages, while in the other, who survived sixteen hours, severe hæmorrhages were found in the brain, kidneys, and suprarenals. Fischer recommends that to prevent the occurrence of such accidents serum should not be given in cases of this kind until labour pains have commenced.

J. Sabrazès,¹⁰ who reports an illustrative case, suggests that the *serous membranes* may be affected by the serum disease like the articular synovial membranes. His case was that of a girl, age 20, who eight days after subcutaneous injection of 210 c.c. of antitoxin for diphtheria, developed a pleural effusion simultaneously with serum urticaria, pains in the joints, and adenitis. Rapid recovery took place after thoracentesis. The cytological nature of the effusion consisted in a lymphocytosis with a few neutrophil polymorphonuclears, monocytes, and plasma cells.

PROPHYLAXIS.—E. Lesné,¹¹ who has tried the numerous drugs recommended for the prophylaxis of the serum disease without success, has found that the use of diphtheria antitoxin deprived of part of its albumin is not followed by the slightest serum sickness, although the immunity conferred, as shown by the Schick test, was the same as that obtained by ordinary antidiphtheritic serum.

TREATMENT.—Cases in which severe reactions following injection of antitænic serum were successfully treated by Autoserotherapy in doses of 3½ to 5 or even 20 c.c. are reported by F. A. Haedo¹² and V. Zerbino and J. J. Leunda.¹³

REFERENCES.—¹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1924, 317; ²*Ibid.* 358; ³*Thèse de Paris*, 1925, No. 247; ⁴*Bull. et Mém. Soc. méd. Hôp. de Bucarest*, 1924, 89; ⁵*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1924, 754; ⁶*Ibid.* 757; ⁷*Ibid.* 313; ⁸*Brit. Jour. Child. Dis.* 1925, 39; ⁹*Zentralb. f. Gynäk.* 1924, 2203; ¹⁰*Gaz. hebdom. des Sci. méd. de Bordeaux*, 1924, 580; ¹¹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1924, 798; ¹²*Anal. de la Fac. de Med. de Montevideo*, 1924, 516; ¹³*Ibid.* 930.

SKIN, CANCEROUS AND PRE-CANCEROUS CONDITIONS OF. (See also RODENT ULCER.)

E. Graham Little, M.P., M.D., F.R.C.P.

H. MacCormac¹ disagrees with the classification which would make rodent ulcer and carcinoma of the skin different entities, and with the view that the one arises from the basal-cell layer, the other from the prickle-cells. In his opinion basal-celled, basocellular, and spinocellular epitheliomata are identical. The differences noted in the type of cell forming the tumour in each case are to be explained by the different rate of growth, small cells resembling those of the basal layer being produced when growth is slow, larger cells with more abundant cytoplasm resulting from more rapid development. It is emphasized that growths involving mucous membrane are in quite a different category. He brings evidence to disprove the dicta: (1) That rodent ulcer is confined to the face. It may occur on any part of the body, and this fact disposes of the theory that rodent ulcer grows in certain embryonic structures of the face. (2) That rodent begins at an earlier age than carcinoma. Statistics of the two types show a curiously equal average age incidence, which is round about 52. (3) That in rodent ulcer glandular and visceral metastases do not occur. Exceptions to this rule are not infrequent, and the author points out that if mucous membrane cases are excluded, metastases are not much commoner

with cases in which prickle-cell epithelioma is demonstrably present. He brings forward a series of 22 such cases, in only 6 of which did enlargement of glands occur. Histological experience also confirms the author in his view that types showing in the same section basal-celled and prickle-celled origin are fairly common, having been met with in 3 out of 16 cases.

Savatard,² who has had an unusually large experience of malignant growths of the skin, confirmed by histological examination, was in general agreement with MacCormac as to the inadvisability of making a hard-and-fast division, clinical and histological, between rodent ulcer and carcinoma, when affecting the skin only. He considers that as the latter is potentially more dangerous, growths of this type should be regarded with more apprehension. The rate of growth is a very important index of malignancy, more important than the histological character. He dealt with the multiform phases which rodent might assume, and suggested the following categories of initial lesions preceding ulceration: (1) Superficial cicatricial (Jacob's ulcer); (2) Hypertrophic; (3) Cystic; (4) Nodular and indurated; (5) Morphœiform; (6) Pedunculated; (7) Scirrhus.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 457; ²*Ibid.* 460.

SKIN DISEASES, RADIOTHERAPY IN.

E. Graham Little, M.P., M.D., F.R.C.P.

X-ray Treatment.—Ullmann¹ makes an attempt to group diseases according to the indications for X-ray treatment. He makes two groups, one for diseases in which he regards X-ray treatment as 'absolutely indicated', the other as 'relatively indicated'. Opinions differ greatly as to this. [Ullmann's views on this matter are given without endorsement.—E. G. L.]

'Absolute' Indication for X-ray Treatment:—

Acanthosis nigricans	Lichen simplex chronicus (Vidal)
Actinomycosis	Lupus vulgaris enulcerans
Basal-celled epithelioma	Lupus vulgaris of mouth
Inoperable carcinoma	Lupus vulgaris of arms, lips, and genitals
Clavus and hyperkeratoses of hands and feet	Sarcoid and sarcoma
Darier's disease	Malignant lymphoma
Dermatitis papillaris capillitii	Mycosis fungoides
Favus	Rhinoscleroma
Genital tuberculosis	Serofuloderma
Leukaemia	Sycosis vulgaris
Lymphodermia	Trichophytosis (deep infection)

Diseases in which the Indication for X-ray Treatment is 'Relative':—

Aene vulgaris indurata	Lichen sclerosus
Condyloma acuminatum	Lichen spinulosus
Seborrhœic eczema and chronic eczema	Chilblains
Impetigo	Prurigo (not of systemic cause)
Epithelioma	Psoriasis
Folliculitis	Seborrhœoids
Keratoma	Tuberculides
Local hyperidrosis	Lupus verrucosus
Keloid	Juvenile warts
Lichen planus	

Radium Treatment in Non-malignant Skin Diseases.—F. S. Burns² contributes a temperate and excellent paper on this subject. The skin disorders for which radium is to be preferred to other treatments he cites as follows: Keloids, vascular and pigmented nævi, lymphangiomata, benign cystic epithelioma, synovial cysts, and rhinoscleroma.

Keloids.—Radium is best for small keloids, X rays for large. Screened doses

should be given, a deep effect being desired. The dosage for children should be half that of adults.

Vascular nævi if small do well, but large superficial port-wine stains are better dealt with by ultra-violet rays, with a water-cooled lamp. *Cavernous nævi* are best treated by radium, heavily screened, so as to eliminate beta rays. Small and large *pigmented nævi* may be removed by radium; minute lesions are better treated with freezing, or electrolysis.

Lymphangiomata do well with radium.

In *epithelioma adenoides cysticum* radium is the method of choice.

Synovial cysts are very successfully treated by this agency.

Lupus erythematosus the author includes in his list for radium treatment, but he is on more debatable ground in this choice.

Senile keratoses are very amenable to radium, and X-ray keratoses are most effectively treated by beta rays, in small dosage.

Common warts of all types are readily removed by radium, but the small flat types and filiform warts are better treated by electrolysis.

REFERENCES.—¹*Wien. klin. Woch.* 1925, April, 488; ²*Boston Med. and Surg. Jour.* 1924, July 3, 16.

SKIN, FOX-FORDYCE DISEASE OF.

E. Graham Little, M.P., M.D., F.R.C.P.

F. C. Knowles and T. H. Drant¹ report 2 cases of this rare condition. They have not been able to collect more than 20 cases altogether in the literature. It occurs as a papular itchy eruption, limited to the axillæ and the pubes, with some rare instances of eruption round the nipple and on the lower abdomen. In both their patients the symptoms resisted all local treatment, as well as X rays. Sections from both these patients are described and pictured, and show, as their most marked feature, dilatation of the sweat-gland coils and degeneration of their walls.

The authors discuss the etiology, and they regard the disease as a separate entity, and suggest that it is due to some derangement of the endocrine system causing an alteration in the sweat secretion. [But no evidence of this causation is adduced.—E. G. L.]

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Oct., 478.

SKIN-GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The operation of skin-grafting can always be performed under a local anæsthetic. It is fallacious to suppose that a local anæsthetic will interfere with the vitality of the graft. It would be to general advantage if students were taught that the treatment of granulating wounds consisted in the first place of skin-grafting, and that grafting should not be performed merely as a *dernier ressort*. The writer invariably removes skin-grafts of every variety after infiltration with novocain solution, and he has found that Wright's perforated celluloid dressing (as used in connection with the treatment of wounds with hypotonic salt solution during the war) is admirable. Furthermore, the writer also scrapes away the granulations from the part to be grafted, the day before; granulations can be scraped away with a spoon painlessly without any form of anæsthetic.

It may be taken as certain that skin taken from another individual will never act successfully as a graft. It has been held by some authorities that if the blood of the donor groups the same as that of the recipient, success may be expected, but in practice such has not been found to be the case. If the skin of another individual is transplanted, a reaction somewhat in the nature of anaphylaxis occurs, with the result that the grafts either disappear

immediately or they may hold for a short time and disappear in a gradual disintegration. C. A. McWilliams¹ deals with this question, and writes an interesting paper on the various forms of skin-grafting. He mentions incidentally, that what has been said of skin-grafting applies also to transplanting of other organs, and implies that any tissues transplanted from one individual to another are "doomed to failure. All skin-grafts should be autogenous, i.e., should always be taken from the patient himself.

There are four common types of skin-graftings: (1) Thiersch's grafts; (2) Reverdin's (according to McWilliams, minute plugs of full-thickness skin); (3) Free, full-thickness, non-pedicled grafts; and (4) Pedicled flaps (not true grafts).

Thiersch's Grafts.—These are almost 100 per cent successful when applied on fresh, sterile operative wounds. These grafts will not take in the presence of severe infection, because they will be floated off the raw surface by the profuse discharge. To make an aseptic surface for Thiersch's grafts there is no better application than sterile gauze soaked in Dakin's solution, changed once or twice daily. No grafting should be done until the discharge is minimal in amount. After grafting, the parts should be immobilized, as a movable base will certainly dislocate the grafts. All writers are agreed that, whatever dressing is used, very firm pressure should be applied over the dressings, as this tends to cause the grafts to adhere more firmly. Thiersch's grafts do not prevent subsequent contraction, and therefore are not suitable in the axilla, neck, popliteal space, etc. The most successful method of closing an old, sluggish, Röntgen-ray burn is not to reflect from the neighbourhood pedicled, full-thickness flaps, because these will slough or not heal on account of the deficient blood-supply, due to the surrounding endarteritis, which exists for a long distance outside the visible ulcer. The only way to cure these intractable ulcers is to curette thoroughly all the sloughy tissues, under a general anæsthetic, since these ulcers are exquisitely sensitive and will not bear the slightest manipulation. The raw area will then require sterilization for a few days with gauze wet in surgical solution of chlorinated soda, changed daily. After thorough sterilization, the tissues surrounding the ulcer should be widely trimmed away until the tissue cuts softer, indicating less connective tissue, and until the edges ooze. After drying the ulcer, autogenous Thiersch grafts should be applied to the whole raw area.

McWilliams mentioned several cases of total avulsion of the scalp, and he says that 173 incidents have been reported in the literature, with 8 deaths. The scalp was replaced in forty patients; in not one single instance did the replaced scalp live. It is taught in some recent text-books that a scalp replaced may survive; apparently there is no ground for this statement—all the evidence is to the contrary. The most efficient method of treating this severe lesion, provided the patient is treated within twenty-four hours of the accident, is to sterilize the raw skull and, at the same time, drill holes into the diploe in that part of the skull that is bare of all soft parts, so as to hasten its granulation; then to shave the avulsed scalp, saving the hair for a future wig; to take Thiersch grafts from its surface at once, and to transplant these grafts to the denuded, raw skull area. Many of the grafts will take when transplanted after twenty-four hours or even after thirty-six hours, since thin skin strips have been proved to live even as long as forty-eight hours after their removal. By this procedure, the resulting raw area left to suppurate will be reduced very materially. This is the plan of procedure, he says, he shall adopt hereafter in any case of total avulsion that comes to him immediately.

Reverdin's Grafts.—McWilliams refers to Reverdin's grafts as full-thickness minute grafts taken up on the point of a needle and placed on the granulating

surface (as described by the reviewer in the *MEDICAL ANNUAL*, 1925, p. 404). McWilliams is mistaken in referring to full-thickness grafts as the grafts of Reverdin. He does not see a wide field of usefulness for this class of skin-grafting. It must be remembered, however, that after an injection of a little local anæsthetic, and with the aid of two instruments, a needle and a knife, numbers of these grafts can be applied to the granulating surface without any inconvenience or pain to the patient. In small granulating areas the method is as good as, and more simple than, Thiersch's method.

Free, Autogenous, Full-thickness Grafts.—Failures by this method are generally to be attributed to improper technique. No fat should be on the under surface of these grafts, this being trimmed off with a scissors. The surface on which the graft is placed must be quite dry. The grafts should be perforated. It is well to put some tension on the graft equal to that in the position from which it was removed. Most essential of all is to apply very firm pressure on the graft, and to keep the parts absolutely immobile for about seven days. McWilliams and Davis use a sea sponge for this purpose. The epithelial layer of the graft may slough, but this does not injure the deeper skin layers. The grafts should not be cut larger than 3 in. long by 1½ in. wide. A high percentage of success follows the method of grafting with full-thickness skin, provided the details are carefully attended to. Firm pressure seems to be the most essential element for success.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1924, July 19, 183.

SKIN, SENILE.

E. Graham Little, M.P., M.D., F.R.C.P.

R. Sabouraud¹ has an attractive paper on the means to oppose the effects of age upon the skin. He considers the use of creams is to be recommended, and supplies a formula:—

R Zinc. Oxid.	3 grm.	Aq. Dest.	5 grm.
Vaselini	20 grm.	Verveine	3 min.
Lanolini	5 grm.		

To this base a powder, coloured or not, may be added. The grease may be removed with cotton-wool soaked in the following mixture:—

R Oil of Sesame	20 parts	Olive Oil	60 parts
Nut Oil	40 parts	Violet Essence	q.s.

To be succeeded by a wipe over with this solution:—

R Acetone (Anhydrous)		Aq. Dest.	6 parts
Alcohol (90 per cent)	āā 3 parts		

For skins infected with the microbacillus of seborrhœa, the sovereign remedy is sulphur, which can be prescribed as a powder, a lotion, or in solution.

As a powder:—

R Talc, Zinc Oxidi, Sulph. Præcip. āā

As a lotion:—

R Sulph. Præcip.	20 grm.	Aq. Dest.	
Camphorated Alcohol	20 c.c.	Aq. Rosæ	āā 50 c.c.
		Shake well.	

As a solution:—

R Carbon Disulphide	100 cgrm.	Crystalline Sulphur	3 gr.
This solution is highly inflammable.			

In a general thickening and reddening of the face, which is a result of seborrhœa, the author recommends friction for eight or ten seconds with **Carbon Dioxide Snow** at intervals of several weeks. [A procedure not without risk.—E. G. L.] In rosacea, the galvanocautery, with a fine needle, is recommended. General treatment should be prescribed at the same time. In plethoric

subjects, food should be cut down, bread, fats, and alcohol prohibited, and an alkaline mixture taken. For senile warts, the galvanocautery is again advised. For xanthelasma palpebrarum the galvanocautery is the best treatment.

On the question of hair dyes, the advice is given to discourage all dyes containing lead or aniline derivatives.

REFERENCE.—¹*Presse méd.* 1925, Jan.

SKIN, TUBERCULOSIS OF.

E. Graham Little, M.P., M.D., F.R.C.P.

J. H. Stokes¹ describes ten cases of primary inoculation of the skin with tubercle, with lymphatic enlargement. It is remarkable that adults were equally affected with children. The primary lesion may be inconspicuous; and the enlarged gland, often remote from the original infection, may be the first noticeable symptom. A delayed adenopathy, developing even after a trivial injury, should be investigated for the possibility of tuberculous infection. A remarkable case is described in which infection was apparently started by a cut on the ball of the toe, the nature of the disease being suspected when the glands in Scarpa's triangle became enlarged. Treatment should include complete excision of the primary focus and the secondary lymphatic glands; if this is impossible, Radium Radiation may be given to the enlarged gland, in large doses, properly screened. Ultra-violet Light from the quartz lamp is recommended for lesions which cannot be excised; and the administration of Novarsenobenzol, in small doses, is recommended.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1925, May, 722.

SKULL AND BRAIN, INJURIES OF.

A. W. Adson, M.D., F.A.C.S.

F. C. Grant,¹ of Philadelphia, emphasizes the recent tendencies toward greater conservatism in the treatment of head injuries. He divides the cases of cranial trauma into three groups: (1) Those which will be fatal whatever is done; (2) Those in which spontaneous recovery will result; and (3) Those in which death will occur if no treatment is given, but life may be saved by proper interference. The criteria of surgical intervention he believes to be the prevention of infection and the relief of increased intracranial tension. Subtemporal decompression is a last resort, and is rarely done earlier than forty-eight hours after the injury, and then only in the absence of shock, and after lumbar puncture and ventricular tap, and the administration of a hypertonic solution by rectum or intravenously.

Emile Holman and W. J. Scott,² of Cleveland, Ohio, in a review of eight cases of skull injury, emphasize the fact that unilateral dilatation and fixation of the pupil is a valuable aid in determining the location of the lesion. In operating for the relief of increased intracranial pressure due to hemorrhage, they believe that this sign should govern the selection of the area to be explored. [The above finding, while it is not always present, is an interesting one and should be looked for. The reviewer has had under his observation patients who have sustained serious skull injuries without presenting a dilated pupil, and it has been his experience that the dilated pupil usually indicates a rather late symptom of pressure in injury cases.—A. W. A.]

Francis R. Holbrook,³ of Des Moines, Iowa, in a discussion of head injuries, emphasizes the necessity of early recognition of increased intracranial pressure by manometric readings of the spinal fluid and ophthalmoscopic readings of the fundi. If the pressure is progressive, repeated lumbar punctures or decompression should be done. Depressed fractures of the vault should be relieved at once by operation.

REFERENCES.—¹*Surg. Clinics of N. America*, 1924, iv, 295; ²*Jour. Amer. Med. Assoc.* 1925, May, 1329; ³*Ibid.* 1924, Aug. 16, 1189.

SMALL-POX.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—C. C. Pierce,¹ senior surgeon of the United States Public Health Service, brings forward statistics showing that small-pox remains the most widely distributed plague in the world, there being practically no country free from it. During the year ending June 30, 1924, 149,550 cases of small-pox, with 22,346 deaths, were reported by health officers throughout the world to the United States Public Health Service. One-fifth of all these cases occurred in the United States, 45 States reporting a total of 30,771 cases. Apart from China and India, during 1923 only three countries in the world where vital statistics are kept and are available exceeded the United States in their small-pox rate. These countries were Switzerland, Russia, and Greece, which had rates respectively of 55, 43, and 33, as compared with 27.1 per 100,000 in the United States. On the other hand, in South Africa, Egypt, Algeria, Finland, Hungary, and the Baltic republics the small-pox rate ranged from 3.9 to 0.35 per 100,000, while the Scandinavian countries, Australia, and New Zealand reported no cases at all. During 1924, 3073 cases occurred in Minnesota, with 306 deaths—a mortality of 9.9 per cent. Of the 306 fatal cases, none had been successfully vaccinated within seven years, and 243 had never been vaccinated, 47 had been vaccinated but the successful vaccinations ranged from 8.75 years before the fatal attack, and 16 were unable to give a definite history of vaccination. In an outbreak at Windsor, Ontario, between Dec. 12, 1923, and March 17, 1924, there were 67 cases and 32 deaths. Within two years over 50,000 persons were vaccinated, and the epidemic promptly subsided. Pierce illustrates the rapid increase in virulence of a small-pox epidemic by the experience of Detroit. Between Sept. 1, 1923, and March 15, 1924, 710 cases occurred, with only 4 deaths. On the other hand, during the period March 16 to June 1, 1924, Detroit had 795 cases with 105 deaths. Exclusive of the cost of patients treated in hospital, which amounted to 2.39 dollars per diem for each patient, the epidemic cost the Health Department 127,854 dollars, and it was calculated that the time lost on account of 784 persons who had small-pox between April 13 and Aug. 31, 1924, amounted to 163 years, 8 months, and 17 days.

R. P. Garrow² has introduced the term '*para-small-pox*' as an English equivalent for the South American '*alastrim*' and the South African '*amaas*', which he maintains is an acute specific infectious disease distinct from small-pox on the one hand and chicken-pox on the other. He claims that the mortality in otherwise healthy subjects is nil, and attributes the usual estimate of 1 or 2 per cent mortality to the fact that these deaths are frequent in very young infants or feeble old people, or result from some condition unconnected with '*para-small-pox*'. Garrow concludes that the administrative measures for the control of the disease could with advantage be modified. On the other hand, Le Dantec,³ whose views are shared by the reviewer, maintains that in the present state of science *alastrim* should be regarded as small-pox, since vaccination conveys immunity against *alastrim* as it does against small-pox. Every varioliform disease which can be successfully checked by vaccination may be regarded as small-pox, and conversely every varioliform disease which is not prevented by vaccination is not small-pox.

PATHOLOGY.—In a paper on the blood in purpuric small-pox, K. Ikeda⁴ states that the principal changes are in the numerical value of the platelets and leucocytes on the one hand and in the morphological structure of the leucocytes and erythrocytes on the other. Marked and progressive thrombopenia characterizes the purpuric type, in contrast with the steady and rapid rise of the platelets after the vesicular stage in all other forms of small-pox. The second feature is a rapid and decisive decline in the polymorphonuclear

neutrophil leucocytes. The third characteristic is the appearance of pathological forms of hæmoblasts, basophilic stippling, and polychromatophilia, without clinical or laboratory evidence of severe anæmia or chronic sepsis. In the terminal stage there is intense bacteriæmia. Large Gram-positive diplococci are found which on cultivation prove to be hæmolytic streptococci. The hæmoglobin and erythrocyte count remains practically normal. The bleeding time is considerably prolonged. Tests for the coagulation time give inconstant results.

DIAGNOSIS.—W. Loewenthal,⁵ as the result of his experience in the Bern epidemic, states that *Paul's test* in its original form (see MEDICAL ANNUAL, 1925, p. 409) is not sufficient, and that in a considerable proportion of cases a macroscopic diagnosis could only be made at the end of seventy-two hours. He found that microscopic control was necessary to a great extent, and could be omitted only when the naked-eye changes were pronounced. The Guarnieri test was of more value, as in many cases in which a diagnosis could not be established by Paul's test a positive result was obtained by demonstration of Guarnieri's corpuscles. In about 84 per cent of his investigations the clinical diagnosis agreed with the laboratory findings.

W. F. Castle⁶ reports a case of *iodide eruption* simulating small-pox.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1925, cxii, 689; ²*Lancet*, 1925, i, 225; ³*Jour. de Méd de Bordeaux*, 1924, 335; ⁴*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1807; ⁵*Schweiz. med. Woch.* 1925, 429; ⁶*Med. Press and Circ.* 1925, i, 8.

SNAKE POISONING.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

L. A. P. Anderson and J. F. Caius¹ have tested the generally accepted view that anti-venomous sera gradually lose their potency with lapse of time, and have come to the conclusion that there is some loss of potency during the first six to nine months, after which there is a sudden increase in potency, which is marked after twelve to fourteen months' storage. Further, light and heat of an ordinary room in the tropics exercised no appreciable influence on the potency.

TREATMENT.—C. Singh² reports a case of *Echis carinatus* bite, seen about three hours later, and treated by incision and the introduction of **Potash** crystals followed by stimulants. On the following morning the patient was brought back in a collapsed condition with hæmorrhage from the mouth, nose, and puncture sites. He was given a pint of **Hypertonic Saline** intravenously, which was repeated three times within the next twenty-four hours, and **Adrenalin** and **Pituitrin** injected several times. Eventually he made a good recovery from a very critical condition.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1925, July, 113; ²*Ind. Med. Gaz.* 1924, Oct., 511.

SPINE, SURGERY OF.

A. W. Adson, M.D., F.A.C.S.

Colin K. Russel,¹ Clinical Professor of Neurology at the McGill University, reports two cases of spinal-cord lesion in which *tumour* was suspected and *lipiodol* was used in making a differential diagnosis. In the first case, a boy of 16 complaining of numbness in both legs and difficulty in walking, the lipiodol was not retarded in its course from the posterior cistern to the caudal portion of the thecal canal. In the second case, a woman of 50 complaining of paralysis of both legs and of the right arm, the lipiodol was arrested at the upper level of the tumour. [It is the reviewer's opinion that the history, together with the neurological and X-ray findings in this latter instance, were conclusive of the presence of a tumour, and that the non-arrest of the lipiodol in its course, in the first case, was not sufficient finding to rule out the possibility of a tumour.

—A. W. A.]

Alfred W. Adson,² of the Mayo Clinic, in an article on the *diagnosis and treatment of tumours* of the spinal cord, reviews a series of 189 cases in which 200 laminectomies had been performed with positive or tentative diagnoses of spinal-cord tumour. Of these tumours, 26 (13.7 per cent) were situated extradurally, producing pressure symptoms on the cord; 62 (32.8 per cent) were meningeal, situated intradurally and producing direct pressure on the cord, but not invading it; 48 (25.4 per cent) were within the cord and intramedullary; in 35 (18.5 per cent) no tumour was found at operation, the lesion being chronic meningomyelitis, but later 4 of the patients were found to have tumours. This last percentage is rather high, but since the review includes the earlier work, it represents a much higher percentage than would a later series; during the year ending October 1, 1924, 38 patients were operated on, in only 3 of whom could no tumour be found. In 18 (9.5 per cent) of the 189 cases, a variety of lesions was found within the vertebral canal which produced pressure on the spinal cord but could not be classified as true tumours of the cord. Four were angiomas or varicose veins of the spinal cord; one was an echinococcus cyst, a part of an extensive lesion of the lung and liver; 2 were tuberculous lesions of the cord; 2 were inflammatory masses due to syphilitic infection, in all probability gummas of the cord and meninges; 2 were cerebellar tumours with spinal projection; and 7 were hypertrophic osteitis of either the laminae, the transverse processes, or the bodies, which resulted in a narrowing of the spinal canal and produced pressure on the spinal cord. Metastatic lesions of the spine were not included in the series; these are fairly well ruled out in view of the history of a primary malignancy, and the positive X-ray findings, which are demonstrated with such ease. Malignant lesions with erosion of the body of the vertebrae are not surgical tumours.

The author emphasizes the fact that a history of slowly progressive paralysis is significant, particularly if it is associated with root pain which is aggravated by lying down, stooping forward, coughing, or sneezing. He stresses the importance of a thorough neurological examination, and discourages the promiscuous use of the various spinal tests, such as repeated spinal punctures, lipiodol injection, and pneumography, except of course when these are definitely indicated. The history is perhaps the most valuable factor in the examination, since it presents, in chronological order, first the symptoms of irritation, then of slight pressure, and then of complete paralysis, which are so characteristic of lesions of the spinal cord. He discusses differential diagnoses, and the significance of the various chemical findings in the spinal fluid, but calls attention to the fact that, apart from the Froin syndrome, too much stress should not be placed on the spinal-fluid findings.

J. A. Sicard and L. Laplane,³ in an article on *diagnosis of tumours* of the spinal cord, state that it would appear that a tumour of the cord, developing in the vertebral canal, ought to produce a definite group of sensory and motor symptoms, differing only with variation in the site of the neoplasm. Clinical experience, they say, proves that this is not always true. The authors report their results and conclusions in this regard following operation in twenty-six cases of tumour of the cord in which they had injected lipiodol.

H. L. Parker and A. W. Adson,⁴ of the Mayo Clinic, in an article on *compression of the spinal cord and its roots by hypertrophic osteo-arthritis*, review the literature, and report eight cases, calling attention to the following facts: (1) That the symptoms simulate those of spinal-cord tumour; (2) That the X-ray findings, while suggestive of hypertrophic osteo-arthritis, are not sufficiently diagnostic to rule out tumour; (3) That if the lesion is recognized, a wide laminectomy is instrumental, not only in checking the progress of the disease,

but in relieving the symptoms and resulting in a recovery similar to that obtained following the removal of a spinal-cord tumour.

Charles A. Elsberg,⁵ of New York, in discussing some aspects of the diagnosis and surgical treatment of tumours of the spinal cord, stresses the significance of *pain as a localizing sign*, and emphasizes the fact that too often the general surgeon does not recognize root pain, and operates on the patient for some abdominal lesion. He discusses the differential diagnosis between true spinal-cord tumour and metastatic lesions producing pressure myelitis, emphasizing the importance of a malignant history and positive X-ray findings.

Walter E. Dandy,⁶ of Baltimore, in an article on the *diagnosis and localization of spinal-cord tumours*, gives a comprehensive review of the literature, the symptomatology, and the differential diagnosis, illustrated with drawings of various types of tumour and lesions producing compression myelitis. He discusses in detail the different laboratory tests used in conjunction with the neurological examination, and states that a careful history and a painstaking neurological examination are adequate to make a correct diagnosis and accurate localization in over 90 per cent of all spinal-cord tumours. In the remaining 10 per cent, the accessory method, air or lipiodol injection, will aid in making the diagnosis and localization.

Temple Fay,⁷ of Philadelphia, in a comprehensive discussion of *cerebrospinal determinations*, emphasizes the dangers of spinal and ventricular punctures. He discusses the types of fluids removed, as well as the different laboratory tests and their significance. Spinal drainage may be done for the relief of intracranial injuries, purulent meningitis, and general conditions, but in the presence of increased intracranial pressure is dangerous. The Queckenstedt test for spinal block is of value in spinal lesions; cisternal punctures are of value, also, in conjunction with lumbar punctures in assisting to establish a spinal block, and in lavage of the cord in meningitis. Lipiodol is mentioned as a means of establishing a level. Ventricular punctures are done for one of two purposes: either for the relief of intracranial pressure, or for injecting air for the taking of a ventriculogram. Medication may also be introduced in this manner.

A. Winternitz,⁸ in an analysis of 87 cases of brain tumour, 19 cases of posterior fossa lesion, 2 hypophyseal tumours, and 19 spinal-cord tumours, emphasizes the importance of local anaesthesia and of the two-stage operation. He is very frank about his mortality, which, in the reviewer's opinion, is rather high for modern brain surgery. It is true that occasionally a two- or possibly a three-stage operation is necessary for the removal of a brain or spinal-cord tumour, but in the vast majority of cases the operation can be performed very successfully in a one-stage procedure.

F. Christopher,⁹ of Winnetka, Illinois, realizing that the convalescence from a *non-operable fracture* of the spine depends upon the ease with which the patient is handled while bedfast, has designed a new type of **Bradford Frame**. Canvas bands are used to support the body and lower extremities, and the frame is narrowed between the axilla and the hips. The frame is suspended by rings and ropes at the four corners. These ropes are attached to a windlass which extends from the foot to the head in the centre of the Balkan frame. By the use of the windlass, a nurse can raise or lower the Bradford frame alone. Additional canvas bands can be placed under the legs and suspended independently on separate pulleys, so that the patient can produce passive motion of his own volition. The frame can be unhooked and removed to a cart at will, giving the patient the opportunity of getting outside during the day.

Franklin G. Ebaugh,¹⁰ of Denver, Colorado, reviews the history, and the physical, neurological, and surgical findings, in three cases of spinal-cord lesion

in which lipiodol was used in the differential diagnosis. There is no question but that lipiodol casts a beautiful shadow when a definite block exists, and is a diagnostic aid. However, the reviewer takes exception to the use of lipiodol when this is unnecessary. [For further warning, see INTRODUCTION.—Ed.]

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1925, May, 514; ²*Arch. Franco-Belges de Chir.* 1925; ³*Presse méd.* 1925, Jan. 10, 33; ⁴*Surg. Gynecol. and Obst.* 1925, July, 1; ⁵*Ann. of Surg.* 1925, June, 1057; ⁶*Ibid.* Jan., 223; ⁷*Ibid.* 1924, Nov., 641; ⁸*Surg. Gynecol. and Obst.* 1924, April, 322; ⁹*Ibid.* 1925, April, 562; ¹⁰*Amer. Jour. Med. Sci.* 1925, 865.

SPIROCHÆTOSIS, BRONCHOPULMONARY. (See LUNG.)

SPIROCHÆTOSIS ICTEROHÆMORRHAGICA. (See JAUNDICE, INFECTIVE.)

SPLEEN, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

In view of the great prevalence of splenomegaly of different forms in the warmer climates, the opinion of Italian surgeons on this subject must be heard with respect. The discussion in the Italian Surgical Society¹ on the indications for splenectomy shows on the whole a tendency towards conservatism, and a feeling of disappointment with the results in many types of cases. Most prominent was the discussion on the value of this operation in *pernicious anemia*. Here, as among our own surgeons, it was felt to be a very dubious procedure. Whether life is actually prolonged is a matter of considerable doubt. Certainly interference is warranted only during a remission, either natural or brought on by repeated blood transfusions. *Spleno-myelogenous leukemia* is not a field for surgery at all. The same results can be achieved by radiotherapy with no risk. The operative mortality is appalling. A possible exception may be made in the very chronic type, but there is no convincing evidence that the spleen is a real factor in the development of this disease. *Hæmolytic icterus* offers the best prognosis after removal of the spleen, but even here it is pointed out that all the symptoms do not clear up. Very numerous other conditions are discussed as possible fields for spleen surgery, but on the whole the attitude is more conservative than that taken by most American surgeons. In each case the condition of the patient, and the extent and progress of the disease, must be carefully considered before any operation is undertaken, and disappointment is to be expected in many cases. The mortality of these operations is always high when any large series is considered. Reports of a few operations are apt to be misleading in this respect. The frequent remissions which normally occur in all blood dyscrasias, and the uncertain course of many of these diseases, offer many possibilities for error, and for these reasons the surgeon should approach the problem with full knowledge that he is working in a field in which our scientific basis is very shaky.

R. B. Coleman and J. E. Bateman² report a series of 70 splenectomies done for *Egyptian splenomegaly*. In these cases the mortality-rate was 15·7 per cent. In this disease the authors believe that in selected cases removal of the spleen offers the best hope for cure. All the patients examined afterwards appeared to be entirely well, a fact which amply justifies the mortality, as no other method of therapy will accomplish anything like such results. About 50 per cent of cases coming into the hospital are suitable for operation. The rest were refused on account of marked ascites, advanced circulatory changes, or concomitant disease. The exposure of the spleen was made through a left rectus incision. As a rule it could be delivered from the abdomen before the pedicle was ligated, and this is by far the best method. As these spleens were large, averaging 3½ lb. in weight, the pedicle was usually long and easily

accessible. In the first part of the series a few operations were abandoned on account of adhesions to the diaphragm, but it was later learned that these could be broken up with little risk. The pedicle was generally ligated *en masse* and the spleen removed, after which the exposed stumps of the vessels were caught and tied separately. In several cases the tail of the pancreas was removed incidentally with no untoward results.

D. B. Pfeiffer and C. M. Smyth, Jnr.³ have made a very important contribution to our knowledge of the function of the spleen by careful observation of four cases in which splenectomy had previously been done for rupture of the organ. In all cases the excised spleen was normal except for the recent traumatic changes. Continued observation over a period of several years showed that definite changes in these patients had been brought about. Examination of the blood went to show that a moderate but definite anæmia is the rule. The platelets are markedly decreased. Hyperplasia of the lymphoid tissue about the body is another constant result. A decrease in the bodily vigour and resistance which has been noted clinically may depend on the anæmia, but in the present state of our knowledge it is impossible to exclude endocrine or metabolic factors as yet unknown.

REFERENCES.—¹*Policlínico*, 1924, Nov. 14, 1494; ²*Lancet*, 1924, ii, 1116; ³*Ann. of Surg.* 1924, Oct., 562.

SPOROTRICHOSIS.

E. Graham Little, M.P., M.D., F.R.C.P.

W. H. Guy and F. M. Jacob¹ report a personal experience of four cases of this rare disease. Three of these occurred in children of the same parents, one boy and two girls, age respectively 8, 6, and 4 years. In the boy, who was the first to be affected, the initial lesion occurred as a 'blind boil' on the left thumb, followed by similar lesions along the left arm, and, later, on the neck and right arm and both legs. The cause was not recognized, and the glands and bones as well as the skin became invaded, and several operations were undertaken during six years of illness. His two sisters were apparently infected in the puncture of the ears to insert ear-rings, for in both the first symptom was an abscess round the puncture. Sporothrix was demonstrated in all three children. The fourth case was in a man of 30, which antedated the three cases recorded and had no connection with them. The disease showed itself as a vesicular dermatitis of the toes, and was at first not unnaturally regarded as an epidermophytosis, but sporothrix was demonstrated to be present. The three children were treated with internal administration of Potassium Iodide, and fractional doses of X Rays on all the parts affected, with excellent result. The man had improved so much with the treatment prescribed for the supposed ringworm infection (application of salicylic and benzoic acid ointment and fractional doses of X rays) that no further treatment was given. The authors found that a successful way to avoid contamination of the culture media by other organisms was to dry the material for some days before planting, by which device contaminations are usually killed out.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1924, Nov. 22, 1663.

SPRUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—L. W. Smith¹ has investigated experimentally the rôle of *Monilia psilosis* of Ashford in animals, using strains from both the Philippines and from Porto Rico, which were identified by Ashford himself as his organism, and concludes that his work supports Ashford's views that the *M. psilosis* is the specific cause of sprue.

E. J. Wood² discusses the relationship of pernicious anæmia to sprue, and maintains that there is no essential difference between them, suggesting a

like etiology, and cultures of the stools of pernicious anæmia cases showed that the *M. psilosis* could readily be recovered from them, although not found in 40 control cases. Further, by feeding guinea-pigs on *M. psilosis* he produced bone-marrow and liver changes suggestive of the action of a hæmolytic poison, and the intravenous injection of a filtrate of the same organism caused hæmolytic blood changes in rabbits. C. Elders³ also compares Sprue with pernicious anæmia, and finds no essential differences between them, so believes that they are closely related; but he thinks the causative factor in both is an unbalanced diet, which is particularly common in the Tropics, where sprue is common in those living on food deficient in animal proteins and fat-soluble A. He states that during ten years he has not lost a case of sprue, but severe cases recovered rapidly since he gave a diet consisting of **Underdone Meat** up to a kilo or more, with $1\frac{1}{2}$ to 2 litres of **Milk with Aqua Calcis** 15 c.c. five times a day, and 15 to 30 c.c. of **Cod-liver Oil** and a few **Oranges** or 400 gm. of **Strawberries** daily. A case of pernicious anæmia was also greatly improved on this diet. Three illustrative cases are given. [I have found vitamin B in the form of marmite soup of value in sprue, and have several times tried small quantities of cod-liver oil, but found it was not digested and did harm.—L. R.]

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, Nov. 15, 1549; ²*Amer. Jour. Med. Sci.* 1925, Jan., 28; ³*Lancet*, 1925, i, 75.

STAPHYLOCOCCUS INFECTIONS.

J. D. Rolleston, M.D.

Two cases of the rare condition of staphylococcus septicæmia, of which an example was described in the *MEDICAL ANNUAL*, 1925, p. 421, are reported by A. Moya¹ and Cabello² respectively. Moya's case occurred in a man, age 25, in whom the high fever and typhoid state at first suggested typhoid fever, but this diagnosis was negatived by the rapid pulse and a leucocytosis of 24,000. The blood cultures were at first negative, but subsequently yielded a pure growth of *St. pyogenes aureus*. The infection originated from an insignificant lesion on the left leg which gave rise to lymphangitis. In spite of injections of sensitized antistaphylococcus vaccine and local treatment, the wound assumed a gangrenous character, and death took place before amputation could be performed. The autopsy confirmed the diagnosis by showing the slight degree of local and general changes characteristic of every septicæmia. Cabello's case was in a man, age 26, in whom the first symptoms, consisting in a rapid pulse and high temperature, developed a few hours after operation for femoral hernia. There was a leucocytosis of 15,200 and a polymorphonuclear percentage of 78. Death took place in two days, physical examination revealing nothing beyond feeble air entry at the pulmonary bases. At the autopsy the operation wound showed a seropurulent exudate from which numerous staphylococci were grown, and cultures of blood from the left ventricle yielded a pure growth of *St. pyogenes aureus*. Apart from slight endarteritis of the femoral artery, nothing abnormal was discovered at the autopsy.

REFERENCES.—¹*Arch. de Med., cir. y esp.* 1924, 349; ²*Med. Ibera*, 1925, 235.

STOMACH, SURGERY OF.

E. Wyllys Andrews, M.D., F.A.C.S.

Edmund Andrews, M.D., F.A.C.S.

GASTRIC AND DUODENAL ULCER.

Conservatism is still the watchword of some of our ablest clinicians. Thus James Sherren,¹ in an able discussion before an international body, sums up his paper with the following conclusions: "I would urge, as far as possible, conservative treatment of lesions, believing that any additional cures that

might be obtained, which I personally deny—as all cases of partial gastrectomy do not regain perfect health—would be more than wiped out by the greatly increased death-rate. I do not consider that the late results of partial gastrectomy surpass those of gastrojejunostomy. Minor complaints, occasional discomfort, and vomiting are met with in 7 or 8 per cent of these. But gastrojejunostomy is an operation perhaps above all others that needs to be carried out with thought and its site carefully chosen. Done in the way I have described, it is an operation that seldom disappoints either the patient or the surgeon. It is the result of my experience that operation is still the line of treatment to be advocated with these diseases.”

K. Patterson Brown² gives sage advice as to the management of *perforated ulcer*, especially as to the question of simple closure or additional gastro-enterostomy. He quotes Gibson on the one hand, and on the other Mills, as showing a divergence of opinion. Also the propriety of drainage is considered in this paper. *Against gastro-enterostomy* the following statements have been advanced: (1) closure alone cures the ulcer; (2) mortality is increased; (3) the danger of spreading peritoneal infection; (4) re-perforation, hæmorrhage, and stenosis are exceptional after closure; (5) the danger of jejunal ulcer following gastro-enterostomy. *For closure with gastro-enterostomy*: (1 and 2) a direct negative of the former statements; (3) gastro-enterostomy relieves symptoms in a large proportion of cases; (4) suture always narrows the lumen to some extent; (5) the incidence of jejunal ulcers is very low.

Simple closure was performed in the majority of cases by means of interrupted catgut sutures, and in many cases the suture line was reinforced by a conveniently placed portion of omentum. Local drainage was never employed, but in a proportion of cases (*see table*) a suprapubic drain was used.

Operation	Cases	Average Age	LENGTH OF TIME PERFORATED				Draught	Recovery	Died	Mortality	Total Mortality
			Under 12 hrs.	12-24 hrs.	24-48 hrs.	Not stated					
Simple closure ..	14	37.4	7	3	1	3	9	11	3	Per cent 21.4	15.78
Closure + gastro-enterostomy ..	5	35.6	5	0	0	0	3	5	0	0	

We find also C. A. Pannett³ discusses ably the surgery of duodenal ulcer. In a series of cases carefully recorded he shows that posterior ulcers heal a little more kindly than those in the anterior wall. He thinks experience shows justification for some other method of handling intractable duodenal ulcer surgically, and believes that gastrectomy has given better results than gastrojejunostomy. Naturally surgeons turn to methods of excision, and this would logically apply to segments of the duodenum itself. Several surgeons have attempted this and found that duodenectomy above the entrance of the bile ducts could be carried out. He describes the technique of this new operation, one of the greatest difficulties of which is the control of hæmorrhage. This is because the pancreaticoduodenal artery cannot be ligated, as the pancreatic circulation would be interfered with. Thus it becomes necessary to tie separately each short branch as it enters the duodenal wall. Another obstacle is the extensive fibrosis which occurs in the neighbourhood of a duodenal ulcer. This agglutination of structures extending even into an indurated pancreas makes it difficult or impossible to find the common bile-duct in all cases. On

first inspection the operation may appear impossible. It is necessary to decide when a normal duodenal wall can be found above the ampulla of Vater. Novak is quoted as declaring that duodenal ulcer never spreads down as far as the duct, and that he was able to do duodenectomy in 41 successful cases; but other writers do not agree with this. Accidental injury to the pancreas may lead to fat necrosis and subphrenic abscess, and, as a greater danger, injury to the common duct. Claremont considers this serious accident rather common. Pannett's own cases showed 16 successful anastomoses in 18 attempts at duodenectomy. His conclusions are by no means rose-coloured as to the future of this radical work. In his opinion surgery is only a temporary expedient in the evolution of the treatment of duodenal ulcer, and is not able at present to confer on the sufferer that relief which medicine is unable to bestow. Gastrojejunostomy should not be abandoned, as it brings about a cure in 70 per cent of cases.

W. H. Barber,⁴ of New York, discusses the end-result of local excision with or without gastro-enterostomy in the work at Bellevue Hospital. His paper includes a discussion of the impaired motility in this disease, and describes some experimental work on cutting one or both vagi. Failure of motility in dogs does not always follow resection of the gastric motor fibres, probably because enough oral stomach remains co-ordinated with the other viscera to act as a pacemaker for the sphincteric end. Barber's theory of innervation disturbances is clarified by a beautiful diagram of the innervation, here reproduced (*Plate LI*). He thinks that excision of ulcers is sometimes advisable by an incision through the anterior wall, care being taken to avoid cutting through the fibres of the vagus.

Another London surgeon, A. J. Walton,⁵ has given us a careful discussion of operative treatment in the stomach fundus for ulcers of either wall. After discussing the history of the operation, beginning with Rydygier's excision method, 1881, which has frequently been performed since and praised by Deansley, he goes on to describe other methods.

The following operations are now recognized: (1) Wedge resection (*Fig. 44*); (2) Transgastric resection (*Fig. 45*); (3) Stitch resection (*Fig. 46*); (4) Caustery excision (*Fig. 47*); (5) Sleeve resection (*Fig. 48*).

Wedge resection is a procedure which requires a considerable amount of practice before it can be safely performed, but when once the technique has been mastered the results are very satisfactory and the mortality is very low. The ease of the operation will depend upon the size, the position, and the extent of the adhesions of the ulcer.

The lesser sac having been opened through the gastrocolic omentum, the ulcer is examined from the posterior aspect, and openings are then made through the gastrohepatic omentum on the proximal and distal sides of the ulcer. The stomach is clamped on either side, one blade of each clamp passing through the lesser sac. The coronary and pyloric arteries are tied close to the clamps and divided, a wedge of stomach containing the ulcer is excised, and first the two edges of the posterior wall of the stomach and then those of the anterior wall are united, each with two layers of catgut. There is no difficulty in turning up the posterior walls sufficiently to insert the seromuscular layer. Should the ulcer be adherent to the pancreas, it is separated after the clamps are applied. This may leave a large opening in the stomach, and the base of the ulcer may have to be shaved off the pancreas. The resulting raw area is covered with peritoneum before the stomach is sutured.

At one time Mayo introduced a modification by opening the stomach anteriorly and excising the ulcer through the opening thus made; the posterior opening being then sutured, the anterior wound of the stomach was closed.

To this operation he gave the name of 'transgastric resection'. Draper and McCarty believed that a somewhat similar process of removal could be safely and more simply brought about by inserting a surrounding autolytic stitch which would lead to destruction of that portion of the stomach within its grasp. However, as nearly all these ulcers are situated on the posterior surface of the stomach or on the lesser curve at the attachment of the lesser omentum, it was frequently a very difficult matter adequately to surround the ulcerated area by such a stitch.

It is quite probable that the good results which so often follow the treatment of a perforated gastric ulcer on the anterior surface of the stomach by the insertion of purse-string sutures and the performance of a posterior gastro-

enterostomy are due to the fact that the suture which is used as a means of closure acts after the manner of an autolytic stitch, and thus a much higher percentage of cures is brought about than would be expected by comparison with the results obtained by the treatment of ulcers of the body by simple gastro-enterostomy.

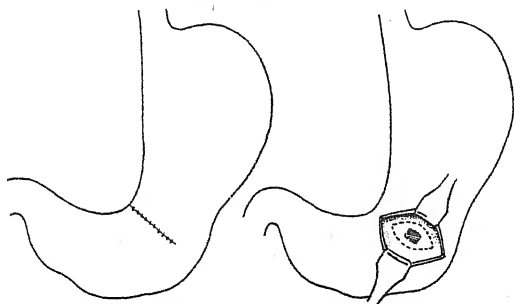


Fig. 44.—Wedge resection for lesser-curve ulcers.

Fig. 45.—Transgastric resection of gastric ulcer.

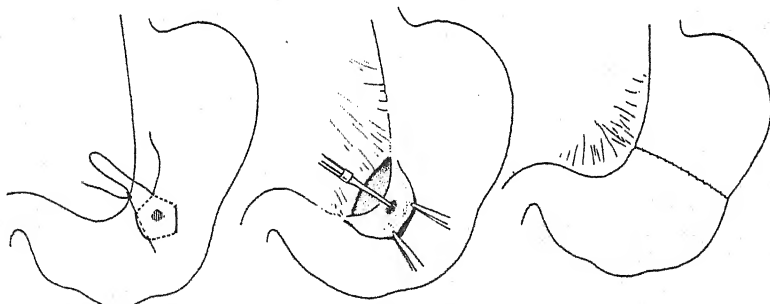


Fig. 46.—Stitch resection.

Fig. 47.—Cautery excision.

Fig. 48.—Sleeve resection.

Figs. 41-48.—OPERATIONS FOR GASTRIC ULCER.

(Re-drawn from 'Surgery, Gynecology, and Obstetrics'.)

Erdmann⁶ gives an interesting review of the Horsley operation for duodenal ulcer. He finds the relief very great, approximately 80 per cent of all cases examined in the follow-up clinic. He considers that the improved Horsley method, involving some recent improvement in the placing of sutures, has shown results very favourable as compared with the Polya, Finney, or Finsterer methods.

T. C. Greene,⁷ of Boston, has an interesting tabulation of gastric and duodenal ulcers variously treated, with the end-results. From various sources he collected 331 cases treated medically, with 70 per cent of cures, and 1019 treated surgically, with 85 per cent of cures.

Grouping statistics from different clinics is, he says, obviously misleading. In order to afford further evidence on this subject, a study has been made of the results of treatment at the Peter Bent Brigham Hospital, in those cases which were followed by letter, examination at the hospital, or re-entry. In this report, cases treated medically are included only where a primary, unquestioned diagnosis of ulcer was made; and in all surgically-treated cases, an ulcer was demonstrated at operation.

CASES TREATED MEDICALLY, 1913-22.

Gastric Ulcers—24 Cases.

Duodenal Ulcers—15 Cases.

	YEARS						YEARS					
	$\frac{1}{2}$ -1	1-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2	2-4	4-	Total	$\frac{1}{2}$ -1	1-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2	2-4	Total	
Complete relief ..	—	3	1	4	2	10	1	2	—	—	3	
Partial relief ..	2	1	1	1	—	5	—	6	—	—	6	
No relief ..	3	5	—	—	1	9	1	2	1	2	6	

Of the medically-treated patients in this series who reported that no relief was obtained, 9 came to operation. Five patients in whom gastric ulcers were diagnosed were operated upon later at this hospital. Four of these proved to have gastric ulcers, and the fifth a duodenal ulcer. In another case perforation occurred within less than a year, and a duodenal ulcer was seen at operation. In still another case, the patient experienced a hæmorrhage after four years. Three cases diagnosed as duodenal ulcer came to operation. One case was operated upon elsewhere. Of two patients operated upon here, one had a duodenal ulcer, and no lesion was found in the other, although definite stasis had been shown. Another patient suffered a hæmorrhage after one year, and another died following perforation two months after leaving the hospital. This patient, the other patient with perforation, and several others had refused surgical treatment, which had been advised by both medical and surgical services.

CASES TREATED SURGICALLY, 1913-21.

Gastric Ulcers—40 Cases.

Duodenal Ulcers—70 Cases.

	YEARS						YEARS					
	$\frac{1}{2}$ -1	1-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2	2-4	4-	Total	$\frac{1}{2}$ -1	1-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2	2-4	4-	Total
Complete relief	1	1	10	20	2	34	—	3	11	37	4	55
Partial relief ..	—	1	2	1	—	4	—	2	1	8	—	11
No relief ..	—	1	—	1	—	2	2	—	—	2	—	4

Multiple Ulcers—7 Cases.

	YEARS				
	$\frac{1}{2}$ -1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2	2-7	7	Total
Complete relief ..	—	2	1	1	4
Partial relief ..	1	—	1	—	2
Hæmorrhage ..	—	—	1	—	1

In this series of 117 patients who were treated by surgical methods, one suffered a hæmorrhage after two years. Six patients in the series obtained no relief, and all underwent a second operation; of these 6, there are no reports of the results of the second operation upon 2 patients; the other 4, re-operated upon at this hospital, obtained complete relief after the second operation; 1 reported after one year, and 3 after two years.

Greene's conclusions are: (1) Of 117 patients treated surgically and followed, 79.5 per cent obtained complete relief, 14.5 per cent partial relief, 5.1 per cent no relief, and 0.9 per cent suffered a hæmorrhage. All those obtaining no relief underwent a second operation, which was successful in all the cases, 4 in number, who replied to follow-up letters. (2) In 259 consecutive operations upon elective and uncomplicated cases of gastric and duodenal ulcers, there were 5 deaths, a mortality of 1.9 per cent. (3) Medical treatment is not without its dangers. (4) In choosing between medical and surgical treatment, the intelligence and the ability of the patient to co-operate must be considered, as well as the clinical aspect of the case. (5) The findings at later operations which were necessary in five cases are reported, and other observations made in the study are recorded.

Still another London surgeon, T. P. Dunhill,⁸ has recorded his personal experiences with duodenal and gastric ulceration. A large number of beautiful plates accompany this article, and his conclusions rest on sound deductions from wide experience. The two conditions most formidable in his clinical work are those of persistent hæmorrhage and gastrojejunal ulcer. In St. Bartholomew's Hospital, from 1921 to 1924 inclusive, 17 patients died from hæmorrhage of gastric or duodenal ulcer. Blood transfusion made it possible to save some others. In such cases some of the surgeons did partial gastrectomy, but Dunhill believes that a less severe operation is wiser in cases almost moribund, and fully as effective. Thus, in one case of a deep ulcer on the second portion of the duodenum, excision would have been impossible. On opening the tube a large callous mass was found which could not be removed. After blood transfusion, gastrojejunostomy was done, with recovery, and the bleeding never recurred. In another case a gastric ulcer was so high in the lesser curvature that it could not be excised. It was reached by a long handle cautery. Recovery also followed in this case after gastrojejunostomy. In Dunhill's series he met five jejunal ulcers. In one there was severe hæmorrhage. Another followed gastro-enterostomy done for perforated duodenal ulcer. In the pathology of these cases he always found an inflammatory mass in the mesocolon around the ulcer closely adherent to the colon, interfering greatly with any operation. The great value of X-ray diagnosis is emphasized in these complications.

From the Alessandria Clinic in Rome, S. Gussio⁹ has reported five new cases of *jejunal secondary ulcer*. As in the English reports, we find these observers recording such conditions as peritoneal adhesions, omental adhesions, and inflammatory masses, occasionally even penetration or perforation, as being ugly complications of this work. The diagnosis has been very much favoured by radiology and the barium meal. For the cure of this condition no one measure has been universally attempted. Dietary has the same value as in primary ulcer. Sometimes the correction of hyperacidity alone is enough. In some cases the stoma has to be enlarged or its position altered, and in a few instances entirely obliterated.

Another paper on secondary jejunal ulcer which deserves careful study is that of O. M. Chiari,¹⁰ who reports a large series of operations from the Innsbruck Clinic. With his usual care and accuracy Chiari has formulated certain conclusions from a large series of these ulcers. The favourite location

is the mesenteric border. Histological study shows in almost all cases deep inflammation with overlying regenerative changes in this membrane. Surrounding the ulcer there is invariably a zone of induration. This includes the submucosa, and sometimes the peritoneal surfaces and omentum. The rôle of infection in such inflammations is not easily determined, but the author thinks it is of considerable importance.

W. C. MacCarty¹¹ reports a series of 425 excised duodenal ulcers from the Rochester Clinic. This is an impressive showing, and the table below and photographs (*Plate LII*) carry much weight on the side of the author's conclusions. From 1906 to June, 1924, there have been 425 duodenal ulcers and 97 localized inflammatory duodenal areas excised at operation and studied grossly and microscopically in the Mayo Clinic. The largest ulcer was 25 mm. in diameter, and the smallest 1 mm.; the average diameter of the ulcers was 5.5 mm.

FREQUENCY OF EXCISION OF DUODENAL ULCER.

	1907-1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	June 1, 1924	Total
Duodenal ulcer	3	0	4	1	12	39	17	6	6	27	49	41	42	27	68	63	18	425
Duodenitis ..	0	0	0	0	1	4	0	0	0	3	3	13	15	12	16	26	4	97
Carcinoma ..	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	3
Hæmangioma	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Hæmangioma	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
Polyp ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Diverticulum ..	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Myoma ..	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Scar tissue ..	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	3
Largest (millimetres)	..	10	10	—	10	8	10	15	15	25	20	25	15	—	—	—	—	—
Smallest (millimetres)	..	2	2	—	1	3	1	1	2	1	1	2	2	—	—	—	—	—
Average diameter (millimetres)	..	6.7	4.8	—	5.6	5	3.9	6	6.9	5.5	5.3	6.1	5.8	—	—	—	—	—

Total number of duodenal specimens excised = 534

Four questions presented themselves in a study of this material: (1) Are duodenal ulcers similar to gastric ulcers in gross morphology? (2) Is there any difference between the appearance of duodenal ulcers at necropsy and at operation? (3) What is the relation of duodenitis to duodenal ulcer? (4) Do we find the same cytological reactions suggesting malignancy in the tubules of duodenal ulcers that we find in gastric ulcers?

Experience with 1269 carcinomatous gastric ulcers, 832 simple chronic gastric ulcers, 425 excised duodenal ulcers, and 97 excised chronically inflamed (duodenitis) portions of the duodenum reveals the following facts:—

1. Chronic gastric ulcers vary from 1 to 40 mm. in diameter, and duodenal ulcers vary from 1 to 25 mm. in diameter.

2. Chronic gastric ulcers vary from 1 to 20 mm. in depth, and excised duodenal ulcers vary from 1 to 5 mm. in depth.

3. All coats of the organic wall may be excavated in both gastric and duodenal ulcers.

4. Both types of ulcer may have their bases adherent to some neighbouring organ.

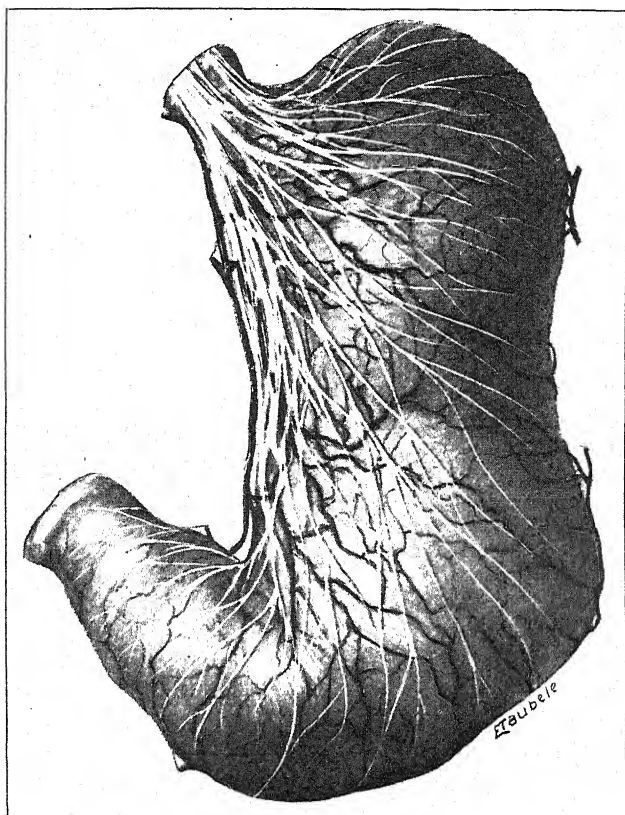
5. There is less scar tissue in duodenal ulcers than in gastric ulcers.

6. Duodenal ulcers are usually in the anterior wall of the duodenum; gastric ulcers are usually in the lesser curvature or posterior wall.

7. There are no cytological changes in duodenal tubules which suggest that

PLATE LI.

INNERVATION OF THE STOMACH

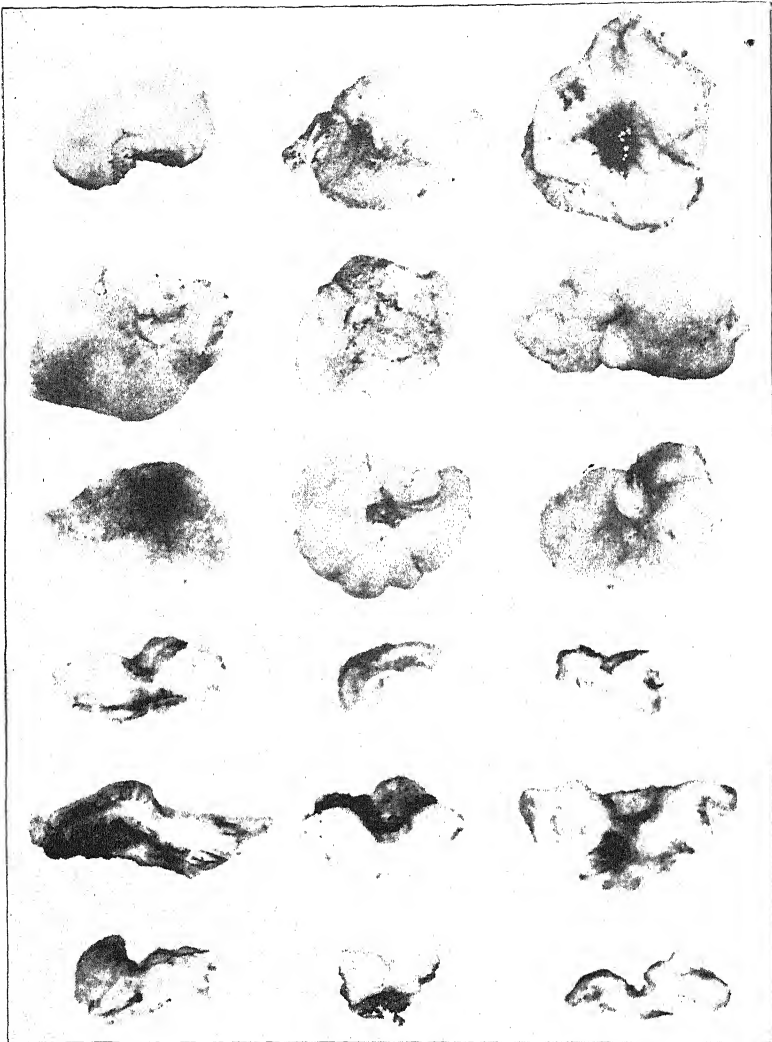


Drawing of human stomach from cast and from dissected specimen lent by Professor Senior; blood-supply and extensive ramifications of anterior vagus apparent, also normal vertical position of organ.

*By kind permission of the 'Journal of the
American Medical Association'*

PLATE LII.

DUODENAL ULCER

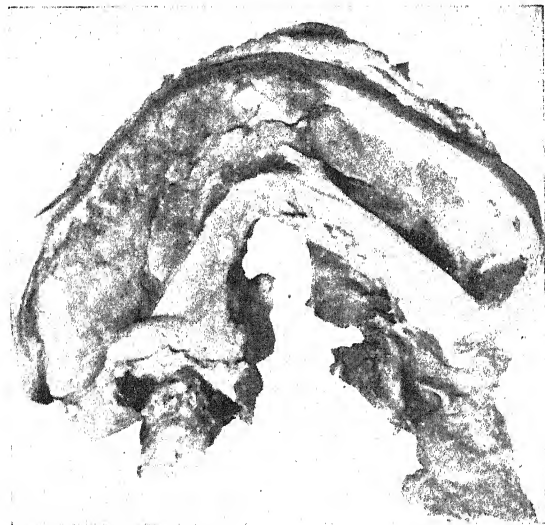
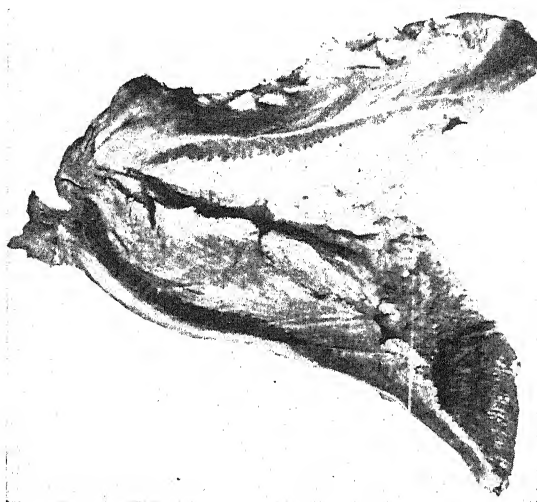


Specimens from a series of 435 excised duodenal ulcers, normal size.

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American Medical Association.*

PLATE LIII.

FIBROMATOSIS OF THE STOMACH



*By kind permission of Dr. S. Wyand and
'Surgery, Gynecology, and Obstetrics'*

1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system of equations (1) as $\epsilon \rightarrow 0$. It is shown that the solutions of the system (1) converge to the solutions of the system of equations (2) as $\epsilon \rightarrow 0$.

carcinoma develops in them. In this series of 425 ulcers, no carcinomatous ulcers were found. During the same period of observation, three carcinomas of the duodenum were observed, but in no instance was there any apparent relation to an ulcer, such as is the case with gastric carcinoma and ulcer.

8. In tubules of the borders of gastric ulcers, one finds three definite cytological conditions:

Some tubules are lined by normal secretory (differentiated) cells; in the tubules of some ulcers the differentiated cells are replaced by undifferentiated cells, which are morphologically indistinguishable from cancer-cells, and sometimes these cells invade the surrounding stroma, in which case we call the condition carcinoma.

In the tubules of the mucosal borders of duodenal ulcers, regeneration of epithelial cells is seen, but when seen, there is evidence of differentiation; the nucleoli are small; the nuclei are smaller in proportion to the total volume of the cell than is the case in malignant cells, and the cytoplasm is denser and more granular than in malignant cells. In duodenal ulcers, the regenerating cells show frequently products of secretion, which, in the author's experience, is never the case in malignant cells.

These cytological differences, be their cause what it may, are significant and very striking, since they are in accord with the clinical observation that gastric ulcers are frequently associated with carcinomatous changes, and duodenal ulcers are not.

Finsterer¹² still advocates radical gastrectomies and pylorectomies for all types of duodenal and gastric ulcers. As noted above, most of the extremists in this direction are dogmatic in asserting the superiority of resecting large areas of even normal acid-secreting stomach wall over palliative gastro-enterostomy. Finsterer again reviews the methods and results of surgical treatment of ulcers of the stomach and duodenum. His own guiding principle is that resection is essential in ulcers of the stomach—not only because of the better results, but also because of the comparatively frequent development of cancer, and the impossibility of diagnosing it without microscopic sections. In ulcers of the duodenum, his method of choice is resection of the ulcer, pylorus, and two-thirds of the stomach. If the ulcer cannot be removed, he resects an even larger part of the stomach. Gastro-enterostomy is reserved only for old people. He requires more and longer observation to decide the question whether the smaller resection with direct uniting of the stomach and duodenum is better than more extensive resection with the modified Billroth II procedure.

This writer reiterates his former plea for extensive removal of callous ulcer and diseased mucosa in all cases lest they develop into cancer.

CARCINOMA OF THE STOMACH.

We come again to the ever-present problem of *cancer of the stomach and its relation to ulcer*. The year 1925 has seen a large number of contributions to this subject, several of them with excellent plates and illustrations, but it must be admitted without striking additions to our knowledge in this difficult field.

Rowlands,¹³ in a clinical lecture at Guy's Hospital, shows that cancer mortality is rapidly increasing in stomach cases, partly because it is a terminal disease in old age. Most of his cases came too late for radical operation. Such development could, he thinks, be avoided by earlier treatment of gastric ulcer.

Aoyama,¹⁴ of Japan, in an excellent paper on the technique of stomach resection, advocates Kocher's resection as a standard measure. After quoting Moynihan's objections and the approval of other surgeons, he gives his own

report of 42 such operations with good average success. A number of photographs of gross and microscopic specimens add to the value of the paper.

One of the most careful and impressive reports on ulcer and carcinoma is the paper of J. Henry Dible,¹⁵ of Manchester, presented as a report on behalf of the Manchester Pathological Society. Great care has been used to fortify each position taken by the essayist, with photographs of actual specimens and slides of all tumours, and the paper, while leaning to the radical or operative side as a preventive of carcinoma, is full of quotations from the best British and foreign clinics, and gives a candid summary of all disputed points.

Anschütz¹⁶ discusses the surgical treatment of stomach carcinoma in the Kiel Clinic. As to diagnosis, he attaches great importance to Röntgenology, which, of course, is to be confirmed by laboratory findings and history. It is especially important that we recognize occult blood in our test. He attempts to draw a distinction in the prognosis between cancer and benign ulceration with reference to the life expectancy. On the whole, life has been lengthened in this clinic by radical operation in recognized cancer cases even when it has not been saved. Naturally wide resection is the operation of choice in all cases. Even when this does not make a permanent cure, Anschütz believes that the average duration of life has been prolonged.

Michon and Polloson,¹⁷ of Lyons, have prepared a careful report of the incidence of *pulmonary complications after stomach operations* and the best precautions for their avoidance. Pre-operative lavage of the stomach has been of value in their experience. This no doubt has a tendency to forestall aspiration into the trachea. In the operation itself they insist on three precautions: (1) Method of anaesthesia. The avoidance of inhalation, especially of ether or chloroform, cannot be emphasized too much. Hence local and splanchnic anaesthesia are to be recommended. (2) They believe there is evidence of the value of extreme gentleness in handling the viscera near the diaphragm. Rough manipulation or chilling of the parts are great sources of irritation. Small traumas, while invisible to the surgeon, are sources of real danger. Therefore speed and smoothness of technique are highly important. (3) The post-operative precautions are important. The utmost attention to diet, the use of proctolysis, and the well-proved value of post-operative lavage and aspiration of the distended stomach are strongly insisted upon.

In Holland we have seen interesting work in the clinic of Schoemaker,¹⁸ of The Hague Clinic. He calls attention to a type of stomach pathology which he calls '*the red stomach*'. In the literature not many cases of this condition are recorded. One of the earliest references to it is by von Hacker, who states that this redness is always the result of perigastric adhesions, and is only a symptom of inflammation. In Schoemaker's cases this redness, which is very striking to the eye, has a peculiar extension. On the one side it ends sharply at the line we call the body of the stomach, or antrum. These parts are never red, and form a deep contrast by their bluish-grey colour. At the opposite side the redness stops sharply at the pylorus, or occasionally continues on to the duodenum. Schoemaker finds similar observations in the writings of Moynihan, from whom he quotes, and also of his pupil Braithwaite. These two observers had carefully worked out the pathology of this surgical curiosity, which seemed to be concerned mainly with the lymph circulation. In several of the recorded cases there was associated acute or chronic cholecystitis. Finally, the work of Latarjet throws light on the condition. He discovered in operating on such patients that, if the nerves of the stomach were cut, a vivid hyperaemia immediately extended over the pyloric part. Another explanation is that the red stomach is a part of the '*periviscerite du carrefour*'

vésiculo-duodéno-pylorique' as described by Enriquez and Carrié, but this statement does not help us much, as the authors do not give an explanation of the symptom. Moreover, there are red stomachs associated with periduodenitis, but there are just as many without this association. The essential point of the phenomenon rests in the dark, but nevertheless it has its clinical importance.

S. Wyard,¹⁹ of London, calls our attention to another anomaly of the stomach wall producing atypical pseudo-growths, namely, the so-called '*leather-bottle*' stomach. It seems that the condition so described appears in at least two forms. The relation of these groups to each other is readily seen in the following presentation :—

Fibromatosis of stomach	{ Local Diffuse }	Leather- bottle stomach
Carcinoma of stomach	{ Diffuse Local }	

Two are innocent and two malignant, while the leather-bottle stomach may be either, and the existence of these two forms explains the difficulty found in deciding whether the condition is one or the other.

Of this condition Wyard has discovered two specimens at the Cancer Hospital, presented by two different surgeons. The two specimens are as nearly as possible identical, and one description will answer for both. The stomach is greatly dilated, and the pyloric portion stands out as a firm, tubular mass, sharply limited to the right at the pyloric orifice and gradually disappearing to the left. The mass is hard and uniform in consistency, the peritoneum over it smooth and regular; there are no nodules beneath it. There are no peritoneal adhesions, and the tumour is very freely movable in all directions. The mass is $2\frac{1}{2}$ to 3 in. long, and the external diameter at the pylorus $1\frac{1}{2}$ to 2 in. It extends a somewhat greater distance along the lesser curvature than along the greater. Since both specimens were obtained by operation and neither patient was examined post mortem, the condition of the whole stomach cannot be shown, but *Plate LIII* is from photographs of the tumours after excision. When the organ is opened, the walls of the pyloric portion are seen to be about an inch in thickness, thickest at the pyloric opening, and becoming steadily thinner as the distance from the pylorus increases, until they pass insensibly into the thin distended wall of the rest of the viscus. The cavity of the stomach is large, but the pyloric canal is occluded and its lumen is merely potential. The mucosal rugæ of the fundus are normal and to a large extent flattened out. Over the tumour the mucosa is extensively destroyed, although there is no obvious ulceration. The internal surface of the mass is nodular, and the margin toward the fundus is heaped up and irregular; it is quite sharply defined. Inspection of the specimen shows quite clearly that the irregularity is not due to any change in the thickness of the mucosa, but of the underlying submucous tissue.

Wyard concludes: Leather-bottle stomach is thus seen to be neither a clinical nor a pathological entity, and is a name that should be abandoned as serving no useful purpose. The controversy as to its nature, whether simple or malignant, is also settled, since it may be either the one or the other. Diffuse fibromatosis or diffuse carcinomatosis are suitable names which aptly designate the two conditions included by the original term.

Bastianelli²⁰ discusses *pylorospasm* as seen in the Roman Clinic. While the physiopathology is fairly understood in infants, he thinks we know far less of the condition in adults. After reporting a series of such cases with successful operations, he asks the question, Is the primary pylorospasm such an entity that we can diagnose it during an operation? He thinks that this is

entirely possible, and describes a technique similar to the Rammstedt operation in infants.

H. B. Devine,²¹ of Melbourne, has given us a careful summary of the *basic principles and supreme difficulties of gastric surgery*. This is based upon carefully kept records of 1000 cases of severe dyspepsia. Among other means of diagnosis the use of the endoscope has proved valuable in his hands. He evaluates with much care the technique of various modern operations, in which large experience makes his conclusions impressive. One of these is as to the value of gastro-enterostomy. The modern surgeon, he says, comes to the conclusion that his most successful and permanent results are obtained in ulcer when he follows Nature's lead and materially modifies the gastric acidity by duodenal alkalinity. Gastrectomy, in the hands of the unskilled surgeon, is liable to kill more people than it would save, over and above gastro-enterostomy, and furthermore our biochemical analysis shows that it requires an operation very much more extensive than is usually supposed, and therefore very dangerous, if we are using it for its hyposecretory effects. Gastro-enterostomy must, therefore, still remain the basis of average gastric surgery.

REFERENCES.—¹*Lancet*, 1925, i, 1066; ²*Edin. Med. Jour.* 1925, April, 207; ³*Brit. Jour. Surg.* 1924, xii, Oct., 273, and *Lancet*, 1925, i, 538; ⁴*Jour. Amer. Med. Assoc.* 1925, Jan. 17, 170; ⁵Walton, *A Text-book of Surgical Dyspepsias*, London, 1925, and *Surg. Gynecol. and Obst.* 1925, June, 761; ⁶*Ann. of Surg.* 1925, March, 631; ⁷*Boston Med. and Surg. Jour.* 1925, xciii, June 18, 1207; ⁸*Brit. Med. Jour.* 1925, i, 1069; ⁹*Policlínico* (sez. chir.), 1924, Aug., 427, and Sept., 476; ¹⁰*Arch. f. klin. Chir.* 1925, March 12, 709; ¹¹*Jour. Amer. Med. Assoc.* 1924, Dec. 13, 1894; ¹²*Klin. Woch.* 1925, Oct. 15, 2017; ¹³*Brit. Med. Jour.* 1925, i, 587; ¹⁴*Ann. of Surg.* 1925, Jan., 125; ¹⁵*Brit. Jour. Surg.* 1925, xii, April, 666; ¹⁶*Münch. med. Woch.* 1925, Jan. 2, 1; ¹⁷*Presse méd.* 1924, Sept. 20, 962; ¹⁸*Surg. Gynecol. and Obst.* 1925, March, 305; ¹⁹*Ibid.* 1925, April, 449; ²⁰*Ann. of Surg.* 1925, Jan., 45; ²¹*Med. Jour. of Australia*, 1924, March 15.

STREPTOCOCCUS INFECTIONS.

J. D. Rolleston, M.D.

J. N. Lande and R. H. McBride¹ record a fatal case of idiopathic streptococcal peritonitis in a female infant of 5 months which presented the following noteworthy features: (1) A relatively prolonged course (4 weeks); (2) The unusually early age of the patient; (3) A remarkably low leucocyte count for a case of peritonitis (1400). M. Yearsly² reports two cases in adults of alarming hæmorrhage following tonsillectomy and due to streptococcal infection. Antistreptococcus Serum had a rapidly favourable effect in both cases, 20 c.c. being given in one, and 25 c.c. in the other.

REFERENCES.—¹*Arch. of Pediatrics*, 1924, 785; ²*Lancet*, 1925, i, 16.

SURGERY: USES OF SUCTION AND HEAD-LIGHTS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Since visiting America some years ago, the writer¹ has at hand almost at every operation the *suction apparatus* illustrated in Fig. 49. Vacuum in the tube is provided for by a water-pump easily attached to any water-tap. The length of the tube depends on the distance of the water-tap from the operating-theatre. The tube walls must be thick. Various terminals for introducing into the abdominal cavity or chest, or wounds in general, are employed, and most useful is the finely perforated terminal shown in the illustration. Next to the suction apparatus comes a good *head-light*. General surgeons have scarcely realized that details cannot be seen deep down in a cavity without the aid of transmitted or reflected light. When operating deep down in the pelvis, reflected light makes all the difference; details of anatomical structures can be seen, and no groping search need be made, nor is guidance by sense of touch relied upon. The advantages of a head-light are marked in operations on the bile-ducts, and when dealing with extensive

cavities of bone. It requires some practice to become accustomed to the use of artificial light, but there are many makes of lamps, especially of French design, which are light and are worn on the head of the surgeon or his assistant. It is only necessary to examine the interior of the nose or the back of the throat, first by diffuse daylight, and then by concentrated artificial light, to become convinced of the necessity of the latter in general surgery, as well as in the surgery of the nose or throat.

The use of a suction appliance as a routine during operation is admirable. In removing a stone from the lower end of a ureter extraperitoneally in Mercer's Hospital recently, the anatomical structures were brightly illuminated by the use of a head-lamp, and on cutting into the ureter, the gush of urine was in no way embarrassing, for the suction apparatus removed the fluid as quickly as it entered the field. In cases of empyema, in abdominal conditions when ascites is present, after prolonged operations, where there has been oozing of blood into kidney pouches, Douglas's pouch, etc., a suction apparatus is invaluable. Furthermore, the injury to the epithelium by the constant use of swabs is avoided.

Lake² makes some interesting remarks in connection with suction. He points out that in cases of perforation of a gastric or duodenal ulcer the aim of the surgeon is to close the perforation and empty the abdominal cavity of fluid, and that this must be performed as rapidly as possible.

"A suction apparatus", he states, "shortens the time taken considerably, and the peritoneal cavity is emptied more completely than by any other means". This has also been the experience of the reviewer, after a trial of nearly three years. "Surgical instinct shudders", says Lake, "at seeing a large cotton swab pushed into the pelvis, twisted around, and then withdrawn, bringing with it portions of detached endothelium and much valuable lymph". The writer has seen the same sponge used many times in the same carnivorous work. It is well known that the use of a suction apparatus during the operation of cleft palate is an admirable aid. Here again, as in the case of the head-light, the nose and throat surgeons have been in advance of those engaged in general work. Lake thinks that the most popular suction pump of the present time is a reciprocating or rotary one worked by a small electric motor. These are only available, however, where the correct type of current is laid on. There are many disadvantages, moreover, mentioned, and Lake devised a suction pump on a totally different principle. It is worked by cylinders of compressed gas, either oxygen or nitrous-oxide; it is vibrationless and quiet in action.

The reviewer believes that the ordinary filter pump worked off the water main fulfils all requirements. A tap with sufficient head of water should be placed within reasonable reach of the operating-table; five or six yards of heavy rubber tubing along the floor are not found to cause inconvenience in practice:

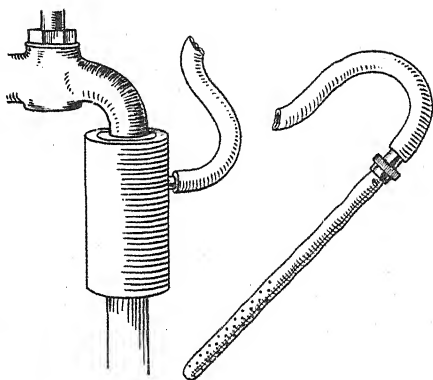


Fig. 49.—Aspirating pump attached to water-tap.
(Re-drawn from the 'Lancet'.)

SYCOSIS.*E. Graham Little, M.P., M.D., F.R.C.P.*

G. Thibierge¹ has some useful remarks on treatment of parasitic (ringworm) sycosis of the beard. He points out that epilation, which is effected by X-ray treatment, is not so necessary in this form of infection, as the hairs in sycosis fall out spontaneously, or very easily pull away in the dressings, which he recommends in preference to X-ray treatment. These are his directions: Remove, with forceps, all hair that comes away easily; cut the beard as short as possible, and apply **Hot Potato-flour Poultices** three times a day. The skin is dabbed with boiled water each time the dressing is changed, i.e., once daily or every other day. Tincture of iodine B.P. is painted on, and allowed to dry before applying the poultice. If the skin should become unduly macerated by the poultices, these should be replaced by dressings soaked in isotonic saline solution to which 1 per mil of zinc sulphate is added.

REFERENCE.—¹*Med. Press*, 1925, June 10, 460.

SYPHILIS. (*See also ANUS, CHANCER OF.*)*Col. L. W. Harrison, D.S.O.*

Extragenital Chancre.—A critical review on non-venereal syphilitic infection, by the Division of Venereal Diseases, U.S. Public Health Service, contains the following instances which may serve as reminders of the variety of ways in which innocent infections may be acquired. Parounagian and Goodman's collection of 320 extragenital chancres of the mouth showed the following to have been the means of infection: kissing, 192; instruments used in certain callings (glass-blowers, musicians, chemists), 37; smokers' articles, 28; drinking-glasses, 26; eating-utensils, 22; toothpicks, 5; artificial feeding of children, 10.

Klauder reviewed 112 cases of chancres of the gums. These, as Milian suggests, should not lightly be attributed to dentists' instruments, especially as they occur mostly in the region of the incisors, which are as much exposed to infection from without as, for example, the tongue. A number of cases of infection contracted in barber's shops, either by shaving or on the scalp, are recorded, and Goodman, reporting one in which the barber went over the face twice, comments on the fact that "Reasoner has determined that soap kills the parasite." Serra saw fifteen cases of infection of nurses and children's maids, eight of whom infected their husbands. The reviewers conclude with the enunciation of certain principles which should be observed by society to avoid infection of the innocent. They include "instruction of all who are liable to come in contact with infected persons—that includes everyone." They add: "Extragenital infection must be kept in mind by the physician."

Parounagian¹ reports a case in which a midwife was infected on the nasal septum as a result of receiving a splash of amniotic fluid over the face when attending a syphilitic woman. [The reviewer is tempted to add an instance of extragenital infection which may be unique. Two motor cyclists collided head on. Both flew forward from their machines, and before they reached the ground one had received a small wound on the forehead from a tooth of the other. A month later a chancre developed on the site of the wound.]

Syphilis of the breast formed the subject of a paper by D. C. L. Fitzwilliams.² Discussing tertiary affections, the author remarked that mistakes are constantly being made, with the result that a condition which is eminently amenable to medicinal treatment is dealt with as a carcinoma. He describes four forms: (1) Fibrotic, produced by the formation of innumerable miliary gummata: probably some chronic forms of mastitis are of this nature. (2) Small, multiple gummata scattered throughout the breast: a rare form. (3) Ordinary gumma, which is comparatively common and is often mistaken for

cancer. (4) Massive gumma affecting the whole breast, which may completely slough off. The diagnosis is not always easy, as is shown by the number of gummatous breasts which have been removed. The author gives the practical advice that syphilis of the breast is commoner than is generally supposed, and should always be considered as a possible explanation of a breast tumour. If the serum reaction is positive, it may not exclude the possibility of the mass being carcinomatous, but the antisyphilitic treatment should be pushed, and the more serious diagnosis considered only when specific treatment is found to be producing no effect.

Syphilitic arthritis is well known as a manifestation of hereditary syphilis, though patients with this disease are often treated for long periods as tuberculous. Gummatous synovitis and the arthritis which sometimes accompanies the rashes of secondary syphilis probably do not often escape recognition for too long; but there are other forms which may continue to suffer under various forms of treatment other than antisyphilitic for many years, and perhaps eventually be relegated to the class of incurables. Mathieu Pierre Weil and P. Bourgeois³ describe some forms of arthritis which they say appear to have escaped the notice of syphilologists. Syphilitic unilateral hydrarthrosis is by no means exceptional. It may be preceded for many years by arthralgia, though sometimes the hydrarthrosis is the first symptom. Some at least of these cases appear to be of the nature of Charcot's joint. An interesting fact observed by Fouquet and others, including the authors, is that the joint fluid frequently gives a positive Wassermann reaction though the blood serum may be negative, just as in meningeal syphilis the cerebrospinal fluid alone may be positive. The second form to which the authors draw attention is an arthralgia occurring in late syphilis. The arthralgia is fleeting, and passes from one joint to another. It is relieved temporarily by salicylates, but relapses when these are suspended; it is definitely relieved by antisyphilitic treatment, the action of which may be very rapid. In a case of the author's the patient's husband had contracted syphilis before marriage. She had had one miscarriage, and an infant who died with meningeal symptoms at three months, but her Wassermann reaction was negative. All signs of arthralgia had disappeared after five injections of '914'. In another form the arthralgia may be limited to one joint. It may be accompanied by a slight peri-articular œdema, so that, if situated in the fingers, these and the hands may have a succulent appearance. If left to themselves, these syphilitic arthralgias may go on to chronic rheumatoid arthritis. The authors give reasons for connecting these joint manifestations with disease of the nervous system. They think, also, that the endocrine glands may play a part, and relate a case in which a patient with multiple arthralgia developed a diffuse brown-black pigmentation but no other symptoms of Addison's disease. Some of the cases which have benefited greatly by antisyphilitic treatment have had negative serum reactions, and the authors discuss the question whether the effect of the '914' may have been non-specific. They incline to the belief that this was not the case, since, as they say, the negative serum reaction proved nothing.

Unsuspected syphilis in women is often discovered by the routine application of the Wassermann test. D. J. Belding⁴ records that, out of 5000 maternity patients, 0.54 per cent had definite clinical signs of syphilis and 1.7 per cent were suspicious, making 2.2 per cent definite and suspicious. By the Wassermann test, however, it was discovered that over four times this number, viz., 9.9 per cent, were syphilitic. [In the reviewer's V.D. treatment centre an investigation of 280 case records of women with no clinical signs of history suggesting syphilis disclosed 40 with positive serum reactions.—L. W. H.]

SYPHILIS OF THE INTERNAL ORGANS.

Gürich⁵ has analysed the reports on post-mortem examinations conducted in the General Hospital, Hamburg, from 1914 to 1924. The number of sections was 23,179, and in these syphilitic changes were found 806 times ('559' in men and '249' in women), the average of approximately 80 per annum having been exceeded in the years 1922 to 1924 by an average of approximately 19. The striking increase in the incidence of syphilitic organ changes during the three years 1922 to 1924 occurred in men, and is attributed by the author to the increased incidence of syphilis in men during the war. The rise in the percentage of cases in which syphilitic changes in the organs were found is illustrated strikingly by a graph which, translated to figures, shows approximately 3 per cent from 1914 to 1919, and after this, in 1920, 3.5 per cent; 1921, 4 per cent; 1922, 4.5 per cent; 1923, 5 per cent; and 1924, 5.7 per cent. These figures indicate either a very high incidence of syphilis in the material examined, or a high incidence of organ changes in the syphilitic part of it. In the cases in which syphilitic changes were found, 86.5 per cent of the men had aortic disease.

These figures may be compared with some quoted by the writer of a critical review on syphilitic involvement of the heart,⁶ as follows: Reid found aortitis in 3.5 to 7 per cent of general autopsies, and in syphilitic autopsies 67.4 to 85 per cent were found with aortitis. Etienne, in 412 cases of syphilis collected from various post-mortem statistics, found 50 per cent with aortitis, while Joltrain recorded 60 per cent. Wilkins and Fitzpatrick found that 167 out of 463 cases of aortic regurgitation were syphilitic; but Roberts put the percentage due to syphilis much higher, 75 per cent. [If only 50 per cent of aortic valvular disease and 90 per cent of aneurysm are reckoned as attributable to syphilis, the average number of deaths in England and Wales from syphilis in these two forms in 1921-23 was approximately one and a half times the number from G.P.I., the total attributable to syphilis from aortic regurgitation, aortic aneurysm, and G.P.I. being 4019 per annum.—L. W. H.] In the women of Gürich's series, hepatic disease was found in 15.2 per cent, and disease of the central nervous system in 16.42 per cent. In contrast to the equality of incidence of changes in the liver and the central nervous system which was found in women, men showed only 3.1 per cent in the liver but 23.5 per cent in the nervous system. The author attributes the high incidence of liver changes in women to their use of corsets. [In using these figures for the purpose of obtaining an approximate idea of the incidence of organ changes in syphilitics, those for disease of the central nervous system should be increased by a figure for general paresis, since few of these would come to section in a general hospital. The authors show proportions of approximately 22 tabes to 13 general paralysis in women, and 50 tabes to 28 paralysis in men. Probably a calculation of 2½ to 3 general paralysis to 1 tabes would be more nearly representative of the relative incidence of these two late effects.—L. W. H.]

The author remarks on the comparative rarity of rectal syphilis, signs of which were found only three times in women and twice in men. The vessels at the base of the brain were frequently diseased, showing either syphilitic arteritis or aneurysmal dilatation. In contrast to the finding of Bergen, these changes in the cerebral vessels were seen more often in women than in men. Bony changes and severe ulcerative processes were found only rarely. The author says that it seems as if the whole aspect of syphilis had changed. The increase in the number of cases in which organ changes were found from 1922 to 1924 was confined to the aorta, tertiary changes in other organs having diminished.

It has been stated by a number of writers that the salvarsan treatment has increased the incidence of nerve syphilis, and it is well that the subject should be ventilated thoroughly, so that our ideas may be clear. In the first place it should be remembered that, although salvarsan was introduced fifteen years ago, its use has been general in civil circles only within the past few years, and that only in countries, such as Great Britain, where the Government has undertaken its free supply for treatment purposes. Before this the drug was much too expensive to be used in adequate amounts for treating the patient of average means. Further, the dosage employed in the early years of the salvarsan era was admittedly much too low, and even now the idea prevails in many centres that a comparatively short course of arsenobenzol treatment is sufficient to eradicate the disease from the average case. The question whether a moderately intensive course of salvarsan treatment results in an increase of late nerve effects of syphilis has been put to a test in this country recently, as a result of a remark by a speaker at a meeting of the Medical Society for the Study of Venereal Diseases, and of an inquiry stimulated by the Health Committee of the League of Nations. The remark was that the modern intensive treatment of syphilis has had the effect of increasing the incidence of neurosyphilis. This provoked an inquiry by the Medical Society for the Study of Venereal Diseases which was addressed to all V.D. treatment centres, and, through the *British Journal of Venereal Diseases*, to neurological clinics, as to the number of men discovered there with syphilis of the central nervous system who had been treated as soldiers during the war by what was commonly known as the 'Army course'. In addition, the British Ministry of Health investigated the records of the Ministry of Pensions and those of a large mental hospital with the same object. The result of the two inquiries⁷ showed 2 cases of tabes, 1 of tabo-paresis, 2 of spastic paraplegia, and 1 of hemiplegia who had received the 'Army course' of treatment during the war. The number (6) may be related to the number of soldiers, approximately 100,000, treated by the 'Army course' of salvarsan and mercury from 1914-18, and, taken in conjunction with the fact that the war commenced ten years and finished six years before the inquiry, does not indicate that even such a moderate course as that given to soldiers in the war has hastened the onset or increased the incidence of neurosyphilis in the patients concerned.

In the same connection, some statistics given by Pinkus⁸ may be quoted. The Berlin National Insurance Institute reported 1700 cases of syphilis in patients over 10 years of age between 1917 and 1924. Of the 1700, 400 had not been treated, and 54, or 14 per cent, had tabes. Mercurial treatment had been given to 800, and 58, or 7½ per cent, had tabes, while of the 500 who had been treated with salvarsan there were only 1.8 per cent with tabes. Out of 3000 old syphilitics amongst prostitutes, 4.4 per cent were tabetic. Of the 3000 were 900 who had not been treated, and 8 per cent of these had tabes. Out of 1700 who had received mercurial treatment, 2.6 per cent were cases of tabes, and the percentage of tabetics in the 400 who had been treated with salvarsan was only 1.9.

The deaths from certain late effects of syphilis may also be quoted from the Registrar General's Statistical Reviews of England and Wales for 1910 to 1923. The table on the next page shows that, as regards general paresis and aneurysm, there has been a decrease since 1901. The figures for tabes show a definite increase in the average for 1913-23 as compared with that for 1901-10; but this must be attributed to some cause other than salvarsan treatment, since it had commenced long before any cases infected in 1910 could have developed tabes. As a matter of fact, the death-rate from tabes increased from 22 per million in 1901 to 28 in 1910 and 31 in 1912. So far,

therefore, as deaths in England and Wales from the three diseases mentioned are concerned, there is nothing yet to indicate that salvarsan therapy has caused an increase. It is interesting that Kraepelin⁹ mentions that the ratio of male to female paralytics was formerly 7 or 8 to 1, and is now 2 or 3 to 1. The mortality statistics for England and Wales show a ratio of 3.1 to 1 for the years 1901-10, and of 4.6 to 1 for 1913-23. Altogether such facts as the reviewer has been able to collect lend no support to the view that salvarsan therapy has caused an increase of syphilis of the central nervous system or of aneurysm. At the same time the possibility must be admitted that the introduction of salvarsan treatment may prove to have been indirectly responsible for an increase of these late effects within the next few years. It is well known that at first salvarsan was believed to be capable of eradicating syphilis by one or a very few doses, and even now many patients receive a quite inadequate amount of treatment, in the belief apparently that a short course of injections, having reduced the serum reaction to negative, has eradicated the disease.

MORTALITY FROM LATE EFFECTS OF SYPHILIS.

	General Paresis	Tabes	Aneurysm
1901-10*	2279.4	538.6	1084
1913	2140	732	1155
1914	2265	720	1131
1915	2263	735	1141
1916	2100	786	1002
1917	2365	757	995
1918	2073	685	864
1919	1608	663	891
1920	1504	609	965
1921	1537	692	992
1922	1698	701	1042
1923	1707	728	992
Ratios of males to females -	4.6 to 1	5.4 to 1	3.8 to 1
Ratios of rates of males to those of females -	5.1 to 1	6.5 to 1	4.4 to 1

* Average

Syphilis as a cause of chronic disease of the vascular and nervous system has been studied by F. Lennmalm,¹⁰ who found, in 10,554 deaths, 327 due to syphilis, as follows :—

General paresis	..	153	Cerebrospinal syphilis	47		
Tabes dorsalis	..	36	Hepatic syphilis	..	3	
Aortic aneurysm	..	65	Pulmonary syphilis	..	2	
Syphilitic aortitis	..	18	Syphilis	3

[The low ratio of tabes to G.P.I. shown in this table may be compared with that in the statistics for England and Wales which have been given above. The percentage of syphilis in which death was due to hepatic syphilis contrasts strongly with that given by Gürich reviewed above.—L. W. H.]

The incidence of *syphilis of the digestive organs* (stomach, intestines, pancreas, and liver) has been studied in 12,000 admissions to hospital by W. E. Gatewood,¹¹ who found it occurred in only a comparative few (0.37 per cent) of the syphilitics in this number. The liver was affected to such a degree

as to give clinical signs in 21 cases, only one being found in 470 cases of secondary syphilis. This contrasts with three cases of syphilitic disease of the liver found in 500 cases of secondary syphilis in the University Hospital of Michigan. In 167 cases of tertiary syphilis, the author found 20 involving the liver, viz., 10 with cirrhosis, 7 with gumma, and 3 with palpable gummata and well-marked cirrhosis. These figures must be regarded as minimal, since, as the author remarks, syphilis of the liver is often discovered only on section. There was a history of fever in 9 cases, and in 3 the temperature exceeded 101° F. The liver was much enlarged in 8 cases, moderately in 8, slightly in 2, and diminished in 1 case. Signs diagnosed as those of syphilitic pancreatitis were found in 2 out of the 12,000 cases; in 5 other cases there was diabetes with signs of active syphilis. The stomach and intestines were very rarely found to be affected with syphilis; the series of 12,000 cases included 286 duodenal and 197 gastric ulcers, and of these only 3 gastric and 1 intestinal lesion were diagnosed as syphilitic. Altogether, in 12,000 general cases, the authors found 45 with symptoms of syphilis of the digestive organs.

Albuminuria in syphilis is reviewed by Ch. Laurent,¹² who adds another type to those usually described as resulting from syphilis. The types ordinarily recognized as syphilitic are: (1) A slight albuminuria in the secondary stage, which disappears after the first arsenobenzol injection; (2) A true acute nephritis occurring in the secondary stage, with oliguria, casts, œdema, and fever; (3) A uræmic type, with headaches, convulsions, and œdema, occurring in patients with a syphilitic history and often believed to be due to syphilis. The fourth type to which the author draws attention is prolonged but curable. He states that it is far from being exceptional: he has discovered it in 15 out of 500 cases. Uræmia occurred in only one case. In none of the others was any sign of nephritis (œdema, casts, polyuria, headache, or convulsions) discovered. The outstanding feature was the albumin, which might be as much as 1.2 to 1.5 per cent. In most of the cases the previous treatment had been intense. Further treatment did not cause rapid disappearance of the albumin except in one case; in the majority three to five courses failed to achieve this result. The duration of the albuminuria was very variable. In one case it lasted only two and a half months, but in others for not less than seven years. In cases in which the trouble disappeared, no relapse was noted in two years. The author insists on the syphilitic origin of this type of albuminuria, furnishing evidence to this effect. The treatment must be very prolonged.

Aortitis is probably the commonest event in syphilis, but one which seems to be recognized only rarely in its earlier stages. At least one would judge this from the number of cases seen in which, only after many months or even years of general cardiac treatment, under which the patient has become more and more crippled, a blood test has been carried out and led to the institution of antisyphilitic treatment. Considering the tractability of syphilitic aortitis, even when it has been causing symptoms for some years, and yet the number of deaths to which it gives rise, there seems every reason for the inclusion of a serum test for syphilis in the routine examination of every patient. H. Schottmüller,¹³ of Hamburg, quotes Eugen Fraenkel's statistics of the cases in the Eppendorf Hospital, Hamburg, in which pathological changes were found in the aorta in 50 per cent of all late cases of syphilis. Also Stadler, who found in 211 cases of constitutional syphilis no less than 82 per cent with syphilitic aortitis. Of these 211 cases, 117 died of aortic disease.

Schottmüller details a number of his cases which illustrate the value of Intensive Treatment with Arsenobenzol, and makes a plea for earliest possible recognition and treatment. He classifies syphilitic aortitis under three

headings: (1) Aortitis supracoronaria, (2) A. coronaria, and (3) A. valvularis. Aneurysm cannot be regarded as an entity: it is a complication of any one of the three types. Of these, the first, in which neither coronary arteries nor aortic valves are involved, offers the best prognosis. It develops insidiously, often existing for years without causing symptoms. These are usually indefinite, and may consist only of palpitation on exertion, mild dyspnoea, or a feeling of anxiety. Eventually there is definite pain and angina, with intervals in which the patient appears to be in good health. In more severe cases there are tachycardia and irregularity, with feeling of pressure in the epigastrium. The author draws attention to the importance of suspecting aortic disease when the pressure feeling increases in intensity during exertion. The Wassermann reaction may be negative and the skiagram reveal no abnormality, but the syphilitic nature of a number of the author's cases was proved by their recovery only under antisyphilitic treatment. The outlook in the other two forms of aortitis is not so good, but the author would always advocate specific treatment. He deprecates too great reliance on iodine, which he says is potentially dangerous since it allows the parasite to continue its deadly work. He maintains that the treatment should be intensive with *Salvarsan*, and that in aneurysm it is not only possible but harmless. Except in cases complicated by meningeal syphilis, in which there is a preliminary course of mercury, he gives to men doses of 0.45 to 0.6 neosalvarsan at weekly intervals to a total of 5 gm. He combines this with injections intravenously of a mercurial preparation, with which he follows the neosalvarsan into the vein before the needle is removed. After the salvarsan and mercurial course, potassium iodide is given for two months. Then for two or three years each patient receives a monthly injection of 0.45 to 0.6 gm. neosalvarsan, but sometimes a second intensive course is administered. [The reviewer can substantiate the author's views as to the value of salvarsan therapy in aortitis, but would generally prefer, in such cases, to administer it in smaller doses (say 0.30 to 0.36 gm.) bi-weekly until the patient's tolerance has been ascertained, because sometimes even so small a dose as 0.45 gm. causes troublesome symptoms. Generally arsenobenzol preparations seem to be tolerated better by these patients when administered deep subcutaneously in the form of sulfarsenol. When the treatment is carried out carefully, the results can be most gratifying even in cases where the hold on life seems at first to be very precarious.—L. W. H.]

PROPHYLAXIS.

W. Kolle¹⁴ sees, in the public advocacy of *Stovarsol* ingestion as a prophylactic against syphilis, a danger that people may forsake the more certain methods of direct disinfection. In contrast to the finding of Levaditi that, in animals, the administration of *stovarsol* by mouth even as long as seven days after inoculation will prevent infection, he says that this has not been confirmed in other laboratories. Thus Worms reported to the Congress of Microbiologists in June, 1924, that, against original spirochaetosis of rabbits, *stovarsol* had proved unsatisfactory as a prophylactic in the State Health Institute. Kolle comments that, before a remedy is given to the public, it should be subjected to a very severe test, and he points out how much more difficult it is to prove a prophylactic than a healing value of any drug. The workers in the Georg Speyer-Haus found that death occurred in most of the rabbits to which *stovarsol* was administered in doses found by Levaditi to be prophylactic. Since only a portion of the dose was absorbed, and *stovarsol* is more toxic when given by the mouth than subcutaneously or intravenously, it must be that the drug is changed, either in the intestine or the liver, and Kolle

thinks it probable that it is reduced to an arsenoxide. Probably, also, small amounts of inorganic arsenic split off may account for the toxic effect. Apart from the uncertainty of the dosage which reaches the circulation, depending as this does on the chemical state of the bowel, Kolle raises the question whether man may not become accustomed to stovarsol, with the result of a reduction in the efficiency of the remedy. There is also the danger that stovarsol, though it may prevent the appearance of the chancre, may permit infection. This question he thinks, as anyone will agree, of the greatest importance, and one demanding research extending to monkeys, as these present symptoms most nearly like those in men. As to the prophylactic effect of **Bismuth**, Kolle differs from the opinion which has been expressed that this is no greater than that of mercury. He found, on the contrary, in 26 animals which had received injections of an insoluble bismuth preparation (bismuth carbonate), and in which radiograms showed persisting deposits of the metal, that inoculation with syphilitic material into the testicles even so long as 109 days after the bismuth injection failed to result in a chancre. On the other hand, in 5 animals which received an easily absorbed preparation, inoculations 68 days later resulted in as many chancres, while in 4 inoculated 14 days after the bismuth injection there resulted 3 certain infections and 1 doubtful. Kolle warns that these experiments should not be taken at once as proof that a deposit of insoluble bismuth in the tissues is a prophylactic against syphilis. As in the case of stovarsol, thoroughly searching experiments must be undertaken, and particularly should inoculations of monkeys be made with the organs of the animals in which syphilis appears to have been prevented.

Schumacher¹⁵ argues that a good prophylactic of syphilis cannot be obtained from stovarsol (by changes in the body), as under the most favourable circumstances only p-oxy-m-aminophenylarsin oxide can be formed from it by the body tissues, and this compound, unlike salvarsan base, is only feebly soluble in lipo-proteids, and its therapeutic dose is too close to its toxic. These facts have been demonstrated by Worms and by Stanfeld. He mentions that he has received a communication from the French workers on stovarsol to the effect that in their animal experiments some of the mice did become dancing mice, just as Ehrlich found, years ago, followed administration of the same chemical compound.

[The articles reviewed above should suffice to prevent the broadcasting to the lay public of stovarsol as a sure preventive of syphilis. It seems reasonable to expect that, amongst the millions of people who would take this drug, would be a proportion whose metabolism would convert it to a poison, causing alarming symptoms. Further, there is much in the fear expressed by Kolle that in a proportion of cases, whether from incorrect dosage or from peculiarity of the subject, the drug would not completely prevent syphilis but prevent only the outbreak of the chancre. In this case there would be great danger of an increase, years hence, of syphilis of the central nervous system.—L. W. H.]

TREATMENT.

Antisyphilitic Serum from Llamas.—Jaureguy¹⁶ and Lancelotti, in 1913, inoculated a female llama by direct contact with a man suffering from a syphilitic chancre. Primary lesions developed in twenty days, and were followed by severe secondaries. Two to three years later, tertiary lesions of the throat and nervous system appeared. After 138 passages through llamas in eleven years, an accidental inoculation in the laboratory showed the infection to be still virulent for man. By inoculations, a serum which was curative of syphilis in the llama was obtained. Administered to man it shortened the

duration of the chancre stage, and secondary exanthemata were more superficial in the serum-treated cases, while the serum reactions became negative. The number of patients treated was 100 in three years; 6 of these showed negative serum in the primary and secondary stages. Favourable results were obtained in general paresis. The work of these authors has not yet been confirmed by others, and judgement on it must, therefore, be suspended.

The Malarial Treatment of syphilis in earlier stages has followed naturally on the promising results of its employment in general paresis. L. Hauch,¹⁷ in an introductory lecture on the treatment of syphilis, refers to the results in 100 cases treated by malarial inoculation in Finger's clinic. Half the cases were in early stages and half in later; most had pathological cerebrospinal fluid. The effect of the malarial inoculation was excellent, particularly in causing the return to normal of cerebrospinal fluid which had remained pathological in spite of energetic drug treatment. It seems probable that in the near future syphilis will present no terrors from the point of view of the central nervous system. Malarial treatment is certainly inconvenient to the majority of patients, but there is reason for hope that a method of protein therapy will be found which will give equally good results.

Malarial inoculation has been employed by B. Dattner and O. Kauders¹⁸ in 500 cases of various diseases, including general paresis, optic atrophy, and some latent secondary syphilitic. They believe that the treatment is indicated in cases where, apart from disease of the central nervous system, there is no acute or severe chronic disease. Contra-indications are low vitality, under-nourishment, and severe hepatic, renal, and splenic conditions. Its use in cardiac disease is largely determined by the amount of compensation.

S. Lomholt¹⁹ has studied the absorption of different Bismuth Compounds, with interesting results. Generally he found that oily suspensions of any compound were absorbed more slowly than watery suspensions or solutions, and for this reason are not to be recommended. Of three compounds in watery suspension or solution, viz., the tartrobismuthate of potassium and sodium, the hydroxide and iodobismuthate of quinine, the first-named was absorbed most rapidly. This was to be expected, since it is soluble in both water and serum. Of the three, he would prefer the hydroxide, since he thinks that the tartrobismuthate is absorbed more rapidly than is desirable. [Those who have worked with bismuth will probably agree that the blue bismuth line on the gums occurs more frequently when using the soluble preparations. The reason may be that absorption from the site of injection is more rapid than excretion, and that redeposition in the tissues is more likely to occur than when absorption is slower.—L. W. H.]

The question of bismuth fastness, the spirochaetes becoming resistant to bismuth as a result of dosage which is insufficient to destroy them, is very important to syphilologists. If *Sp. pallida* can become resistant to bismuth as a result of a therapy which is too feeble, and if this resistance is passed on to spirochaetes transmitted to other hosts, it means that, in course of time, bismuth (or any other remedy to which *Sp. pallida* can become resistant) will become useless in the treatment of syphilis. As to the possibility of the resistance to chemotherapeutic remedies being passed on from one generation to another though passed through different hosts, Gonder²⁰ has shown that this happens in the case of *Sp. recurrentis* and *Sp. gallinarum*. Giemsa²¹ found, by giving successive subtherapeutic doses of sodium tribismuthyltartrate to a rabbit infected with syphilis, and passing the virus through a second rabbit to a third during 148 days, that the spirochaetes developed some resistance, though this was not absolute. The resistance, moreover, persisted when the spirochaetes were transferred to another animal. An interesting observation

made during these experiments was that the chancre resulting from inoculation with *Sp. pallida* from a rabbit which had been treated with a series of subtherapeutic doses of bismuth, developed more quickly and reached a large size, while the spirochetes in it were extraordinarily long and active. There is a possibility that a similar resistance may be developed to other antisyphilitic remedies, if these are administered in subtherapeutic doses.

The effect of continuation treatment with mercury on the incidence of syphilitic relapse after the blood serum has been rendered negative by a course or more of arsenobenzol and mercurial injections has been studied by E. Glynn, R. E. Roberts, and Phoebe Bigland²² by testing over a period of months the blood sera of 503 patients. Some of these had absented themselves from the clinic for months after the first course, and had consequently received no further treatment. Others had continued to attend and received continuation treatment by mercury, usually in the form of injections during the first year and of pills in the second. Two groups were thus formed, those who received mercurial continuation treatment and those who did not. When the percentages of relapses in the two groups were compared, it was found, to the surprise of the workers, that those who had received mercurial continuation treatment relapsed more frequently than those whose treatment had been in abeyance. The authors advance a number of possible explanations of this unsuspected outcome of their investigations, such as depression of immunity by the toxic effect of mercury, and the development by the spirochetes of resistance to mercury. That which appeals to the reviewer is that the mercurial continuation treatment, being insufficient to destroy the spirochetes, stimulated them, just as a subspirochaeticidal dose of any antisyphilitic preparation can be seen to do in the early stages of syphilis: that, in fact, the mercury given as continuation treatment produced a chronic Jarisch-Herxheimer effect. The results have an important bearing on a practice which is very common in antisyphilitic treatment, and against which the reviewer has argued in various papers.²³ The patient receives a course of injections sufficient to render the serum reactions negative. Then, on the assumption that a negative serum reaction does not mean that the patient is cured, the syphilologist prescribes two years' mercurial treatment, believing, apparently, that this would be sufficient to cure an average case of syphilis without the help of the preliminary course of arsenobenzol injections. It is a comfortable belief, and would perhaps be sound if mercurial treatment for two years is in itself sufficient for a cure. Unfortunately, as the reviewer has repeatedly pointed out, serological tests show that two years of mercurial treatment does not cure the average case of syphilis; at least, when this is administered on customary lines.

Toxic Effects of the Metals employed in the Treatment of Syphilis.—These hamper the work of the syphilologist, since the fear of their development keeps the dosage lower than experience dictates to be necessary for a rapid cure. The therapeutic results being obtained to-day from courses of as many as ten injections of '914', with mercury or bismuth, are not so good as were obtained from three full doses of '606' with ten of mercury before the war.²⁴ The old '606' was fiercer in its effects both on the tissues and on the parasites, and considerations of safety have led to the refinement of arsenobenzol preparations and the reduction of individual doses, with correspondingly smaller effects on the parasites. In order to avoid a small percentage of untoward results, the dosage of the remedy for the average case of syphilis is fixed at a much lower point than the average patient can tolerate. The desideratum is an antidote which will save the situation surely when the intolerant patient develops signs of a toxic effect, so that the dosage for the average may be fixed at a higher level. Of all antidotes, probably **Sodium Thiosulphate** (*see* MEDICAL ANNUAL,

1925, p. 444) has received the greatest support, and C. C. Dennie²⁵ and W. L. McBride, who were amongst the first to follow up Ravaut's advocacy of the use of sodium thiosulphate in metallic poisoning, give the results of further experience with this antidote. These confirm their original view that sodium thiosulphate is a highly efficient and rapid antidote to the common metallic poisons, arsenic, mercury, lead, and bismuth, so that it is now possible to administer higher doses of arsenobenzol and bismuth than has been thought to be safe for average cases. The authors advocate the use of smaller doses of thiosulphate than have been employed by some workers, and consider that the indifferent results obtained in some places have been due to the dosage being too high. They think it is rarely necessary to go beyond 0.6 gm. intravenously. The discussion which followed the reading of the author's paper revealed a remarkable uniformity of opinion favourable to the use of sodium thiosulphate. Marion R. Groehl and C. N. Myers²⁶ publish the results of their biochemical investigations which show that sodium thiosulphate hastens the excretion of metals. They suggest that solutions should be freshly prepared.

Thiosinamine is recommended by S. S. Greenbaum²⁷ for the treatment of arsenical dermatitis. It is very soluble and non-toxic, and its action is very rapid. The author has the drug put up in ampoules containing 3 gr. dissolved in 6 c.c. distilled water, with one or two drops of 2 per cent glycerin. It is given intravenously each day. He cites cases illustrating the good effect of the treatment. In one the patient, who was suffering from severe dermatitis after receiving four injections of '914', developed fever, vomiting, and general pains. Sodium thiosulphate, 1 gm. four times daily, was administered by the mouth, but the symptoms and rash became much worse during the next forty-eight hours, the temperature rising to 104°. Thiosinamine injections were commenced and were rapidly beneficial, so that by the sixth daily injection the rash had disappeared and the temperature was 99°. Two days later the patient was discharged from hospital in excellent health.

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SYPHILIS, CARDIOVASCULAR. (See also ANEURYSM.) J. E. MacIhwaine, M.D.

S. B. Boyd Campbell, M.D.

Early diagnosis of syphilis in the heart and blood-vessels is of the utmost importance in the prognosis and treatment of cardiovascular syphilis. W. Amelung and A. Sternberg¹ examined 275 cases of syphilis in the early stages and followed them for years. Almost 50 per cent of the patients showed subjective symptoms of cardiac involvement, such as tachycardia and other pulse changes, cardiac murmurs, dilatation, etc. The changes were in some instances very slight; in others definite signs of cardiac weakness were found, though grave disturbances in compensation were not observed. They advocate early and adequate treatment.

Syphilis of the Aorta.—F. A. Willius and A. R. Barnes,² in a study of 140 cases of syphilitic aortitis over a period of from one to eight years, divide their series into three groups: (1) Early stage; (2) Moderately advanced stage; and (3) Advanced stage. In the early stage there were no characteristic physical signs pointing to aortic disease except the peculiar tambour-like accentuation of the second aortic tone and the absence of hypertension. This sound is differentiated from that found in hypertension and atherosclerosis of the aorta, where the second sound has a metallic character or is simply accentuated. In the moderately advanced stage a systolic aortic murmur is usually obtained, and in almost half the cases the second sound has the tambour-like quality. The systolic murmur is probably due to the internal roughening. In only three of these patients did the X rays show even slight to moderate dilatation of the aorta, though in many cases cardiac enlargement was noted. In the advanced stage aortic regurgitation was present, with its associated physical signs. In this stage there were 88 males and 12 females. No patient was free from cardiovascular symptoms such as dyspnoea, palpitation, pain, etc.; 50 of the 140 patients had had anginal attacks, 6 having typical and the rest atypical attacks. The authors conclude by emphasizing the importance of early recognition and of intensive and prolonged treatment of aortic syphilis in order to prevent gross and permanent damage.

In his report on aortic syphilitic insufficiency, R. W. Scott³ describes 25 cases which were observed clinically, and the diagnosis confirmed by post-mortem in every instance. The anatomical changes found in all cases were: (1) Syphilitic mesaortitis, with extension of the process to the aortic area, causing insufficiency at the orifice; and (2) Hypertrophy and some degree of dilatation of the heart, chiefly the left ventricle. One case in four had some grade of coronary occlusion. The histological changes in the heart muscle were similar to those seen in hearts hypertrophied from other causes, and Scott thinks that to attribute these changes to latent myocardial syphilis seems unwarranted by the evidence afforded by his series of cases.

The Frequency of Syphilitic Heart and Visceral Disease.—An investigation into the frequency of cardiovascular and visceral syphilis was made by A. Wittgenstein,⁴ whose statistics of 40,553 patients in the Poliklinik of the Medical University Klinik in Berlin, during 1911 to 1923, are as follows: (1) 7.54 per cent of the patients had visceral lues. (2) 8.09 per cent were being treated for heart and visceral diseases, of which about one-fifth were of syphilitic origin. (3) The syphilitic heart and visceral diseases compose about one-fifth of all syphilitic internal diseases, and the luetic nerve diseases likewise one-fifth. (4) Without special investigations, which are a work of the future, no conclusions can be drawn about the connection between visceral lues and exogenous influences. (5) Aortitic valve failures and aneurysms are in the proportion of about one-quarter each, sclerosis about one-tenth, muscular diseases about 4 per cent. (6) About three-quarters of the aortic insufficiencies are of luetic origin. (7) Of all renal scleroses, about one-quarter are of luetic origin. (8) 17 per cent of all neurosyphilis on the one side, and heart and cardiovascular and visceral lues on the other, are combined forms. (9) The average time of incubation is about twenty years. (10) The average age at the beginning of the disease is 48 to 52. (11) 56 per cent of the patients had a positive history of syphilis. (12) 11 per cent had been treated before; 45 per cent remained untreated although they knew of the infection. (13) Of all the patients, 4.64 per cent had a positive Wassermann; of the luetic cardiovascular diseases, 66.6 per cent.

REFERENCES.—¹*Deut. Arch. f. klin. Med.* 1924, Sept., 34; ²*Minnesota Med.* 1924, April, 227; ³*Arch. of Internal Med.* 1924, Nov., 645; ⁴*Munch. med. Woch.* 1924, Sept. 26, 1354.

SYPHILIS, CONGENITAL.

Reginald Miller, M.D., F.R.C.P.

The prevention of congenital syphilis by the treatment of the mother during pregnancy is the subject of a valuable and hopeful contribution by J. S. Lawrence.¹ The ravages of untreated syphilis were first investigated. It was found that in a group of 65 multiparæ there had been 256 conceptions but only 114 living children, so great was the death-rate before or after birth. Of the living children, many were conspicuously marked with the stigmata of the inherited infection. The scheme of treatment for the pregnant mothers consisted of a course of 8 intravenous injections of arsphenamin and 15 intramuscular injections of mercuric salicylate. It was found possible to keep most of the patients keen on their treatments; particularly were the primiparous patients anxious to be cured. The results were very satisfactory. The numbers of interrupted pregnancies, the still-births, and the deaths soon after birth were all very greatly reduced, and the scheme as a whole could be counted a success. It would have been interesting if the condition of the living infants obtained could have been reported on in greater detail.

TREATMENT.—The treatment of congenital syphilis, in the view of H. Schussler, Jr.,² has not been as successful as it should, because sufficiently drastic methods have not been used. He has employed what he terms an 'intensive' treatment with good results. He is anxious to prove that some of the objections to drastic treatment of young syphilitics are quite groundless, and his results certainly suggest that large doses of arsenical and mercurial drugs can be tolerated very successfully. It is particularly interesting to note that the author claims success in dealing with the later symptoms, such as interstitial keratitis, by his intensive method.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, Feb. 7, 432; ²*California and Western Med.* 1925, April, 446.

TABES, INTRATHECAL TREATMENT OF. (See also INTRATHECAL MEDICATION.)

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The discovery of the *Spirochæta pallida* in the central nervous system in cases of tabes and G.P.I. not merely removed these diseases from the category of so-called parasymphilitic diseases, but has encouraged clinicians to persevere with antisymphilitic remedies in the hope of destroying the syphilitic organism in these highly obstinate maladies. Early diagnosis is of supreme importance when we recollect that within the central nervous system, unlike the peripheral nerves, once nerve-fibres and nerve-cells have undergone degeneration, regeneration is impossible. Therefore, although we may hope by suitable treatment to prevent further advance of the malady in the central nervous system, a certain amount of irreparable damage is bound to remain.

Tabes is a late result of spirochætal infection, and the organisms have been demonstrated post mortem in the spinal cord and posterior nerve-roots. The clinical symptoms of pains, sensory loss, ataxia, etc., are due to progressive irritation and destruction of posterior root-fibres and their continuations within the spinal cord; the progress of the disease is the result of continued action of the spirochætal toxin. To arrest this progress, our duty is to combat the spirochætal infection by every means in our power. Three chief methods are at our disposal: (1) General treatment by administration of spirochæticidal drugs, such as mercury, potassium iodide, arsenobenzol, bismuth, etc. These remedies are administered by the mouth, or by intravenous or intramuscular injections, as the case may be. (2) The pyrexial treatment, consisting in inoculations of malaria or relapsing fever, of tuberculin, of nucleinate of soda and its congener phlogetan, etc. (3) The method by intrathecal administration of remedies directly into the subarachnoid space.

In 1912 Swift and Ellis¹ introduced their method of treatment by intrathecal injections of **Salvarsanized Serum**. The serum is prepared by withdrawing blood from the patient himself within an hour or less after an intravenous injection of salvarsan or neosalvarsan; the blood is allowed to clot, and the superjacent serum, after activation over night at a suitable temperature, is injected by the lumbar route, immediately after withdrawing a corresponding amount of cerebrospinal fluid, which is incidentally used for cytological, chemical, and biological observations and controls. The amount of arsenic injected by this procedure, of course, must be very small. It seems probable that the beneficial effects of intrathecal salvarsanized serum are attributable, not so much to the minute quantity of salvarsan contained therein, but rather to antibodies evoked by the salvarsan, or, still more, to the protein shock of the serum. Sicard in Paris, and Wile² in the United States, have injected minute doses of salvarsan or neosalvarsan directly into the spinal canal, after dilution with the aspirated spinal fluid, whilst Byrnes³ introduced horse-serum mercurialized *in vitro*. The addition of minute quantities of neosalvarsan dissolved in cerebrospinal fluid has yielded good results, both clinical and serological, in a number of cases, but it is not without risk. I myself can recall three cases, two of tabes and one of general paralysis, in which, after three or four intrathecal injections of neosalvarsan, followed by rapid clinical improvement, the patient suddenly developed an attack of acute softening of the spinal cord, with motor and sensory paralysis.

Gennerich⁴ has described a method of administering neosalvarsan by 'double puncture', carried out as follows: An upper lumbar puncture is performed between the 1st and 2nd lumbar vertebrae; to this is attached a burette, and 10 to 14 c.c. of fluid are withdrawn, and then neosalvarsan, $\frac{1}{4}$ to $\frac{1}{2}$ mgrm., is added in solution by means of a pipette. Meanwhile a lower lumbar puncture is carried out by a second needle at the 4th or 5th lumbar interspace, from which 50 to 100 c.c. of cerebrospinal fluid are withdrawn and again mixed with a similar minute quantity of neosalvarsan. The fluid at the upper lumbar level, containing the more concentrated neosalvarsan, is now reinjected and followed up by the more dilute salvarsanized fluid through the lower needle, thereby, as it were, washing the spinal meninges and pushing the more concentrated remedy towards the upper end of the spinal column, the patient subsequently being placed, as in all cases of spinal injections, with his hips elevated and his shoulders low. Müllern-Aspegren,⁵ of Stockholm, records his results by Gennerich's method in 44 cases of cerebrospinal syphilis, including 18 tabetics, 8 general paralytics, 8 cases of cerebrospinal syphilis, and 10 of syphilitic meningitis. He admits that the differentiation between the last three categories is somewhat doubtful; but in all his cases there is no doubt that the patient showed positive syphilitic reactions in the cerebrospinal fluid. His best results were seen in syphilitic meningitis, cerebrospinal syphilis, and tabes. The least successful were the cases of general paralysis. Gennerich himself claims better results. Thus, in his series of 38 general paralytics treated by double puncture supplemented by ordinary neosalvarsan and mercurial treatment, 5 cases were unimproved or even aggravated, 7 were slightly improved, and 24 were much improved and the remissions had lasted from one to four years, so that the patients had gone back to work. Early cases, as would be expected, show the best results. Gennerich has sometimes given as many as 39 or 40 intrathecal punctures in a single case.

Marinesco and Drăganescu,⁶ of Bucarest, claim similar encouraging results, both clinical and serological, by Gennerich's method in a series of 34 neuro-syphilitics, including 17 general paralytics, 7 tabetics, and 7 cases of cerebral syphilis. Double puncture produces a febrile reaction for the first twenty-four

hours, during which, in a few cases, the patient has retention of urine; this, however, quickly yields to an injection of pilocarpine. One or two patients had root-pains and other signs of meningo-radicular irritation. One general paralytic had an epileptiform fit within a quarter of an hour. Marinesco and Draganesco, in order to show whether or not these lumbar injections actually reach the brain, have taken the opportunity of studying dying patients in whom, seven to fourteen hours before death, they injected 5 to 10 c.c. of ammonio-citrate of iron by double puncture. After death, the brain and cord are fixed in formalin solution and hydrochloric acid. All the parts reached by the ammonio-citrate solution show a blue coloration from the deposition of particles of Berlin blue. By this method an intense blue coloration is seen naked-eye all along the spinal cord and its membranes, up into the basal cisterns and the base of the brain, including the region of the optic nerves and olfactory bulbs, and even along the Sylvian region of the cerebral cortex. The cerebral cortex, however, is not deeply penetrated, as seen in microscopic sections, which show the pigmented granules only in the superficial layers.

None of the foregoing observers seem to have realized how much easier and more efficient it is, if we wish to reach all parts of the cerebral cortex, to introduce remedies not in the lumbar region but directly into the cisterna magna through the occipito-atlantal ligament. I myself for some years past have reserved intralumbar treatment by salvarsanized serum to cases of tubes and spinal-cord syphilis, whilst I have treated cases of cerebral syphilis and early general paralysis by intracisternal injections of autogenous salvarsanized serum, preceded in the case of general paralysis by a course of inoculated malaria.⁷

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TABES, OPTIC ATROPHY WITH. (See EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.)

TACHYCARDIA. (See HEART, ARRHYTHMIA OF.)

TENDON TRANSPLANTATION FOR PARALYSIS.

E. W. Hey Groves, M.S., F.R.C.S.

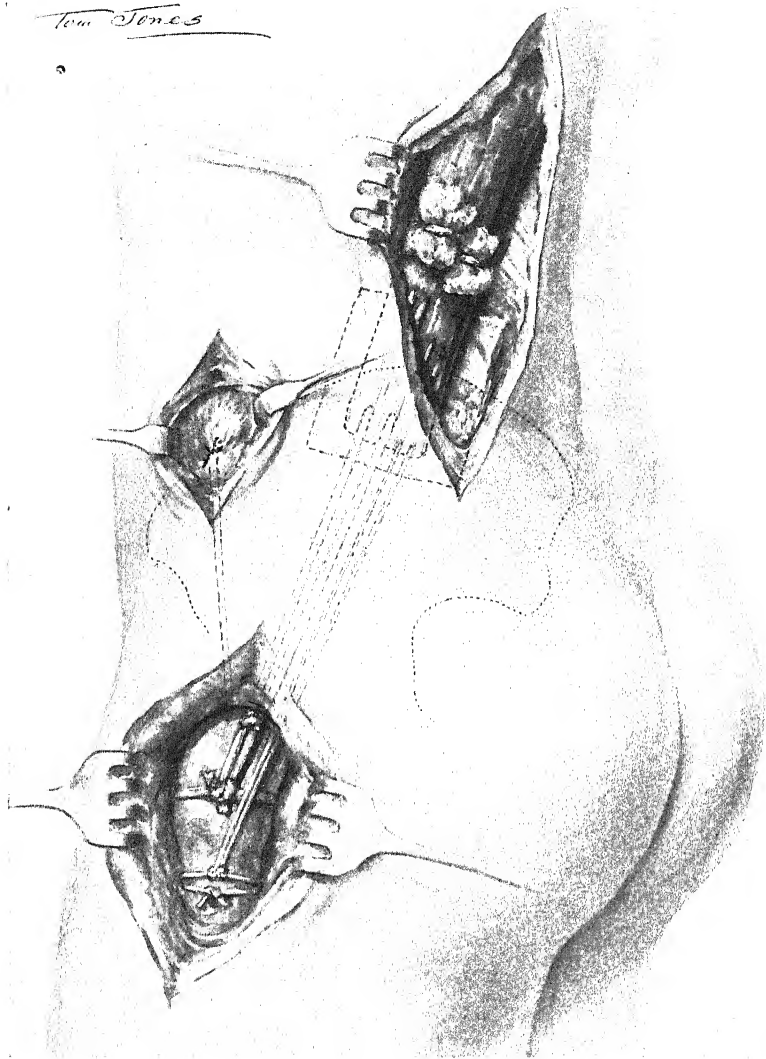
The substitution of one muscle or muscle group for another has always seemed a daring experiment and one which defies physiological principles, especially when a flexor muscle is converted into an extensor. But experience has shown that in some cases, notably in musculospiral paralysis, the transplantation is followed with brilliant success. In the leg muscles, substitution of the quadriceps by the biceps or the tensor fasciæ femoris usually gives good functional results. The leg and foot muscles which afford greatest scope for the operation unfortunately give the poorest result.

Infantile Paralysis affecting the Leg.—The critical question as to whether the patient will ever be able to stand or walk without crutches or more elaborate apparatus depends upon whether the gluteal muscles, and especially the medius and minimus, are sound or paralysed. Hitherto gluteal paralysis has meant permanent crutch progression. Therefore any possibility of a living substitute for the glutei must be considered with great care and attention. Both in Germany and America the tendon of the tensor fasciæ femoris has been transplanted to the great trochanter. Another possibility has been suggested by P. H. Kreuscher.¹ He suggests the utilization of the erector spinæ as an abductor of the hip (Plate LIV). Two incisions are made, one over the

PLATE LIV.

TENDON TRANSPLANTATION FOR PARALYSIS

Tom Jones



Substitution of the erector spinae for paralysed gluteal muscles. The silk cords have all been securely tied with moderate tension on the erector spinae muscle. A rectangular piece of fascia, shown by dotted lines, has been sutured over the crest of the ilium and affords a smooth sliding surface. The short incision exposes the anterior portion of the crest of the ilium, and the dotted line indicates an additional cord of silk which is attached to the periosteum of the iliac crest above and the tip of the great trochanter below. All incisions are closed without drainage.

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length of the lower end of the erector spinae, and the other over the trochanter major. Through the former the back muscle is exposed, and one half of its thickness freed from its attachment for about 6 inches. Four stout silk sutures are woven into the substance of the muscle so as to form a tendon. This new tendon is brought down through a tunnel connecting the two incisions and fixed to the great trochanter. A strip of fascia lata is sewn over the crest of the ilium where the silk tendon passes over this structure. In the one case, a girl of 9, on which this suggestion is founded, the operation gave a most gratifying result, the patient being able, eight months after, to place her entire weight on the leg and to walk without a crutch.

Median Nerve Paralysis:
Ape-hand. — Much rarer than the last, but an important paralysis, is that of the median nerve causing the so-called ape-hand, in which the thumb cannot be brought round in opposition to the fingers. Kortzeborn² has carried

out successfully a reconstructive operation to remedy this defect. It consists in lengthening the extensor tendons of the thumb and then tying the thumb to the ulnar side of the hand by means of a strip of fascia lata (Fig. 50).

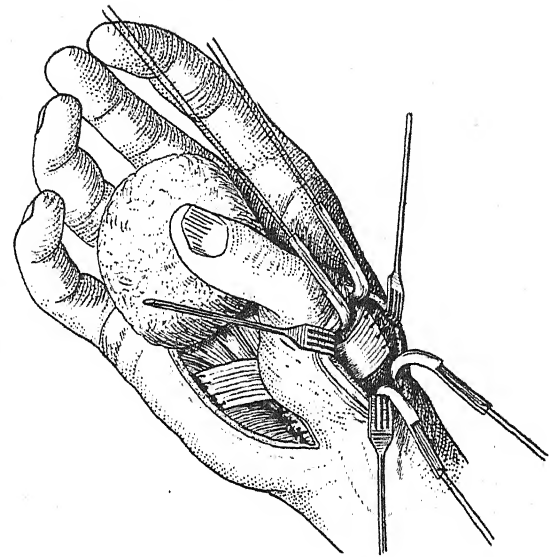


Fig. 50.—Kortzeborn's reconstructive operation in median nerve paralysis. (From the 'Archiv für Klinische Chirurgie'.)

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1925, May, 593; ²*Arch. f. klin. Chir.* 1924, Nov. 24, 465.

TENDONS, PAINFUL. (See FEET, PAINFUL.)

TESTICLE AND EPIDIDYMIS, SURGERY OF.

Sir John Thomson-Walker, F.R.C.S.

C. G. Mixer¹ reports a series of 168 cases of *imperfectly descended testicle* which were operated upon at the Boston Children's Hospital. All were below the age of 12 years at the time of operation; and atrophy, as judged by the fact of the testis being diminished to three-quarters of the normal size or less, with loss of the normal firm consistence, was found at operation in 10 per cent of 90 boys between the ages of 6 and 12 years, in 6.3 per cent of 63 boys below the age of 6 years, and in none below the age of 4 years. The writer considers that spontaneous atrophy of the testis is less frequent before than after puberty, being very rare in young children, and that interference with the spermatic vessels leads to atrophy in 85 per cent of cases, in spite of the presence of the artery to the vas. As the tendency to atrophy increases as puberty is approached, and the imperfectly descended testis is more liable

than a normal organ to circulatory complications, Mixer concludes that spontaneous atrophy is a result of interference with the testicular blood-supply in some way due to the malposition. For this reason, as well as on account of the predisposition to malignant disease and the frequent association of troublesome hernia which may be difficult if not impossible to control, the writer recommends **Orchidopexy** in all these cases in order to restore as far as possible the normal anatomical conditions, and so give a chance for the spermatogenic function to be retained as well as that of the internal secretion. He attributes the number of poor results following this operation to an imperfect understanding of the principles upon which the operation described by Bevan was based. Operative failures can be divided into three classes: (1) Those in which atrophy, the result of interference with the spermatic vessels, follows an operation at which a testis normal in size and consistence was found; (2) Those in which retraction follows because, owing to insufficient lengthening of the cord, the testis has been placed in the scrotum under tension; (3) Those in which both atrophy and retraction follow operation. Sufficient length of the cord can usually be obtained by removing its fascial and cremasteric coverings and, after separation and retraction of the peritoneum from the posterior abdominal wall, by carefully dividing the fine fibrous bands which anchor the spermatic vessels to their surroundings. The chief obstacle to sufficient lengthening of the cord is fixation of these vessels; but the author considers that their division is only called for in about 10 per cent of cases, usually in the case of an intra-abdominal testis, and he believes that surgeons relying on the accessory circulation through the artery to the vas divide the spermatic vessels too readily, with the result that within a few months atrophy almost invariably ensues. Mixer prefers to operate between the ages of 5 and 12 years, because at an earlier age the structures are so delicate that injury to the spermatic vessels is difficult to avoid, and he has obtained good results in 79 per cent of his personal cases in that the testis remained in the scrotum and subsequent atrophy did not occur. He is unable to state whether or not the spermatogenic function is favourably influenced by orchidopexy carried out with due care before puberty, but he hopes that later observation of bilateral cases may afford valuable information on this point.

P. Turner² analyses the results in 50 cases of imperfectly descended testicle treated by trans-septal orchidopexy. The steps of the operation are briefly as follows: (1) A small incision is made in the external oblique just above the internal abdominal ring, and, after drawing the internal oblique upwards, the spermatic cord and funicular process are exposed just below the internal ring within the infundibuliform fascia. (2) The spermatic cord and testicle are withdrawn from the inguinal canal, and the hernial sac or patent processus vaginalis which is nearly always present is removed completely after opening the fascial sheath. (3) The fascial sheath is divided, and the attachment of the gubernaculum to the tissues of the groin is torn through, the gubernaculum just below the testicle is transfixed and ligatured, and the ends of the ligature, left long, are secured with forceps. (4) An incision is made on the opposite side of the scrotum, and a bed for the misplaced testicle made between the scrotal septum and the normally placed testicle. (5) The forceps holding the ends of the ligature are passed through the incision in the external oblique, along the inguinal canal, through the external ring, and well down into the scrotum, so as to impinge against the septum, which is pushed before them into the scrotal wound. (6) A small incision is made in the septum over the points of the forceps, which are then pushed through this incision, and the ends of the ligature are secured. (7) The forceps are withdrawn slowly, and are opened from time to time so as to make a way for the passage of the testicle,

which is then drawn into position into the opposite side of the scrotum by traction on the ligatures. No sutures are required to fix the testicle in its new position, for retraction is prevented by the elastic contraction of the small opening in the septum. In bilateral cases an interval of about six months is allowed between the two operations, so as to determine the success of the first before the second is undertaken.

The results of 50 operations on 43 patients, 7 of whom were bilateral cases, were observed at periods varying from one to two years after operation; 35 (70 per cent) gave a completely satisfactory result anatomically, in that the testis was found to be at about the same level in the scrotum as the normal one, and approximately of the same size and consistence. It was not adherent to the scrotal scar, and there was no induration around it or the cord. No pain or other disability was complained of, and the hernia scar was satisfactory. After 8 of the operations (16 per cent) the result, though good, was not wholly satisfactory, in that the testicle, though not actually atrophied, was either distinctly smaller or situated at a higher level in the scrotum than the normal testicle; usually it was both smaller and higher, but without pain or other disability. Failure followed 7 of the operations (14 per cent) in that the testicle was small, soft, and atrophied, and in some cases had practically disappeared.

While the imperfectly descended testicle usually produces its internal secretion, so that secondary male characteristics are normally developed, spermatogenesis is as a rule absent, so that in bilateral cases the patient will probably be sterile. In the series under discussion, the physiological result of the operation described could not be determined, as this can only be done by tracing the history of patients with a bilateral deformity who have reached adult life, and none of the bilateral cases in the series are yet of an age to render this possible.

W. T. Belfield,³ discussing *hematogenous infections of the seminal duct*, draws attention to three cases which have come to his notice of infection of the seminal tract by the *Entamoeba histolytica* in which the parasite was isolated from the vesicles or epididymis or both, and one in which typhoid bacilli were identified by smear and culture in the seminal fluid of a typhoid carrier in whom no typhoid organisms could be found in the stools or in the urine withdrawn from each kidney by ureteral catheter. Each of the cases in which the *entamoeba* was found had had treatment with emetine for recognized amœbiasis of the intestine until the parasite could no longer be detected by repeated examination of the stools.

As the result of their experience of the use of **Turpentine Injections** carried out over a period of two years in 100 cases of *epididymitis*, mostly of gonorrhœal origin, Wren and Tenenbaum⁴ conclude that the method deserves a prominent place in the treatment of epididymitis. From 0.5 to 1 c.c. of a 20 per cent emulsion of rectified turpentine oil in sterile olive oil is injected close to the bone at a point in the posterior axillary line two finger-breadths below the crest of the ilium, and repeated, if necessary, every other day. On an average, three to four injections were administered in a given case.

According to K. M. Walker,⁵ amongst measures for the relief of pain in an epididymitis already established, **Diathermy** is of the greatest value. In very acute cases in which this has failed, puncture of the epididymis and withdrawal of a small amount of exudate is of great benefit. Gonorrhœa is the commonest cause of sterility in the male, and there is evidence that **Epididymotomy** reduces the incidence of this sequela.

Discussing *tumours of the testis* which simulate epididymitis, J. D. Barney⁶ states that, although neoplasms originating in the epididymis are rare, yet they certainly do occur, and tumours originating in the corpus testis sometimes involve chiefly the epididymis, especially in the early stages. In this way a

clinical picture closely simulating that of a subacute or chronic inflammatory process, such as tuberculosis, may be encountered, as is shown by three cases described in detail, one of which was a sarcoma, one an embryonal carcinoma, and the third a teratoma. The writer is of opinion that, in all cases of serotal tumour in which there is any doubt as to the diagnosis, immediate exploratory operation should be advised.

R. M. Handfield-Jones⁷ has collected 23 cases of *malignant disease of the testicle* from the records of the past fourteen years at St. Mary's Hospital, London. All who have remained alive and well, except one who has been most recently operated upon, were seen personally and thoroughly examined. One treated by radical operation is dead, and of 22 cases in whom simple *Orchidectomy* was performed, 4 could not be traced, 5 are dead of whom 2 lived over 4½ years after operation, 2 are alive but suffering from metastasis, whereas 11 are alive and well with no evidence of metastasis, one 11½, one 8½, one 4½, two 4, one 3½, three 1½ years, and two less than 1 year after operation. The operative mortality was nil. The writer compares these results with those published recently by Hinman, who found that of 79 cases submitted to the radical operation, 5 could not be traced, 24 died from metastasis, 6 were alive but suffering from metastasis, 34 were alive and well, and 10 died as the result of the operation. It will thus be seen that whereas the radical operation has a serious operative mortality, simple orchidectomy has none, and, in addition, the results of the latter operation seem to be, if anything, rather better than those obtained by the former.

G. E. Rice⁸ finds that out of 147,567 male patients seen at the Mayo Clinic between 1912 and 1922, there were 391 with incomplete descent or ectopia of the testis, of whom 3 developed undoubted malignant disease of this organ. During the same period, undoubted malignant disease was noted in 49 cases in whom the testes had descended normally. Of these 52 cases of malignant testicle, 43 were followed up after simple orchidectomy had been performed with no operative mortality, and 14 of these died either of recurrence or metastasis within the first year except one, who lived for 3 years, while 8 died in whom it was impossible to elicit the exact cause of death. The remaining 21 who were followed up were living and well with an average length of life after operation of 4.47 years, 19 having reported no recurrence or any other impairment of health, whereas one had a recurrence 4 years before which was excised, since when there has been no complaint, and one returned with a recurrence 2 years and 3 months after operation and is now undergoing X-ray and radium treatment. In this group of 21 the pathological findings were in 8 cases carcinoma, in 2 sarcoma, and in 11 a mixed malignant tumour. During the same period, a clinical diagnosis of malignant tumour of the testis was made in 50 cases not operated on, because of obvious metastasis in 45, diabetes in 1, death from influenza in 1, and refusal of operation in 2. Twenty of the cases operated on (46.51 per cent) can thus be regarded as surgical cures.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1924, Sept., 275; ²*Guy's Hosp. Rep.* 1925, April, 209; ³*Jour. Amer. Med. Assoc.* 1925, June 13, 1818; ⁴*Surg. Gynecol. and Obst.* 1924, Oct., 503; ⁵*Clinical Jour.* 1924, Sept 24, 457; ⁶*Jour. Amer. Med. Assoc.* 1925, Jan. 24, 245; ⁷*Lancet*, 1924, ii, 850; ⁸*Colorado Med.* 1924, July, 196.

TETANUS. (See INTRATHECAL MEDICATION.)

TETANY. (See also FACIAL IRRITABILITY; PARATHYROID GLAND.)

Reginald Miller, M.D., F.R.C.P.

It has been for long surmised that, owing to the close association of idiopathic tetany with rickets, there is some connection between tetany and disturbance of calcium metabolism. Of recent years, since more convenient

methods of estimating the calcium contents of blood serum have been in use, it has become generally held that tetany is due directly to a fall in the blood calcium. G. H. Anderson and S. Graham¹ have reinvestigated this view, and conclude that the problem is by no means as simple as this. Were it so, a low calcium should exist in every case of tetany, and tetany should exist whenever the calcium is low; also the severity of the tetany should vary directly with the degree of calcium reduction. Their investigations were directed towards establishing the three foregoing propositions, of which the first only was proved accurate. They formulate their conclusions as follows: (1) Active tetany is always accompanied by a diminished calcium content of the serum. The severity of the tetany, however, bears no relation to the diminution of the calcium. (2) Latent tetany may or may not be accompanied by a low calcium content of the serum. (3) The production of acidosis invariably leads to the disappearance of the signs of tetany, irrespective of a rise in the calcium content of the serum. (4) The CO_2 combining power of the venous plasma is within normal limits in infantile tetany.

REFERENCE.—¹*Quart. Jour. Med.* 1924, Oct., 62.

Ivor J. Davies, M.D.

TREATMENT.—Grace Anderson¹ reports on the treatment of infantile tetany by the acid-producing salts. György² has recommended Ammonium Phosphate or Ammonium Chloride. Gamble and Ross³ have used Hydrochloric Acid. Anderson has found Calcium Chloride "invariably safe and always successful". The drug is administered in 30-gr. doses every four hours to a child who has recently had convulsions, carpopedal spasms, or laryngismus. The urgent symptoms disappear in a few hours, but the electrical excitability and facial phenomenon take two or three days to vanish. If Cod-liver Oil is administered at the same time and afterwards, the tetany will have completely disappeared within a period of three weeks. The drug is tolerated easily by infants, and no bad after-effects have been noted.

J. B. Youmans and I. W. Greene⁴ report a case of *gastric tetany* favourably treated with Ammonium Chloride, administered intravenously, 400 c.c. of a 0.82 per cent solution. They recommend the drug for temporary and pre-operative treatment. The use of alkalis and gastric lavage is contra-indicated in gastric tetany.

REFERENCES.—¹*Glasgow Med. Jour.* 1925, March, 159; ²*Jahrb. f. Kinderheilk.* 1922, xlix, 1; ³*Amer. Jour. Dis. Child.* 1923, xxv, 470; ⁴*Jour. Amer. Med. Assoc.* 1925, March 14, 808.

THROMBO-ANGIITIS OBLITERANS.

J. E. MacIntwaine, M.D.

S. B. Boyd Campbell, M.D.

As this disease is usually associated with the Jewish race, it is interesting to find E. D. Telford and J. S. B. Stopford¹ recording four British cases. They describe it as a disease of the larger blood-vessels, which, although of unknown origin, shows the histological features of an inflammatory lesion. The vessels mainly affected are the larger arteries of the limbs, but the disease is seen to some extent in the veins. Thrombosis occurs, and is followed by organization of the clot, producing grave embarrassment of the circulation. It occurs almost exclusively in males. In 90 per cent the onset is usually in the third decade. The lower limbs are affected more than the upper, and it usually starts in one limb, going to the other in one to four years. The first symptom is pain on exertion, situated in calf or foot; absence of pulse in the dorsalis pedis, posterior tibial, popliteal, or even femoral artery will be noted. Later oedema occurs, with peculiar and trophic lesions or even gangrene. The duration is very variable; cases usually end in gangrene. Of the authors'

4 cases, 1, age 40, had a history of ten years' symptoms prior to amputation of the leg; 3 of the cases had amputation of the leg and showed the typical pathological changes in the vessels. A lymphocytic invasion (not a polymorphonuclear as noted by others) of the coats of the arteries and veins appears to be the initial stage, the cells being replaced by fibrous tissue. The lumen is occupied by clot which is gradually organized.

A series of 25 cases is reported from China by F. N. McIneny and G. G. Miller.² They give tables showing the occupation, age, habits, and vessels affected, and end with the following summary and conclusions: (1) Thrombo-angiitis obliterans is found extensively in China among the Chinese; 24 cases in and around Peking present practically all of the pathological features of the disease which Buerger has described. (2) The process appears to be an inflammatory one, attacking the large and small arteries and veins in an irregular manner and causing thrombosis and obliteration. It is not necessarily progressive either from below upward or from above downward. (3) The nutrient arteries of the nerves are frequently the site of this process. This may in some manner explain the severe pain which is constantly associated with the disease. (4) An extensive collateral circulation develops as a result of the blocking of blood-vessels, as is shown by X-ray pictures of injected vessels. In some cases this collateral development can keep pace with the obliterating process and maintain the circulation. In other cases it cannot keep pace with it, and then more or less extensive gangrene develops. (5) In those cases in which there is general and local evidence that the collateral circulation can keep pace with or outrun the obliterating process, and the gangrenous area is small, the treatment should be conservative operation. In the other cases the treatment should be radical operation. Only in border-line cases can conservative general treatment be expected to be of much avail.

TREATMENT.—The treatment of this disease usually ends in amputation, but we find H. B. Phillips and I. S. Tunick³ describing Röntgen-ray Therapy as being so far successful. They give stimulating doses consisting of from 10 to 15 minutes' exposure alternating at weekly intervals over the mid-anterior and posterior aspects of the body, from the 10th dorsal to the 5th lumbar vertebrae in lower-extremity affections, and over the cervical and upper two dorsal segments in upper-extremity disturbances. The following factors were used: 5 ma., 100,000 volts, 5-mm. aluminium filter, 15-inch distance. Of the 50 cases treated, in only 2 per cent was amputation required, as compared with 60 to 80 per cent reported elsewhere. They had a uniformity in improvement in the trophic and circulatory disturbances, as well as relief in the most distressing symptom, pain. They state that their observations only extend over one year, and therefore definite conclusions as to results cannot be given, but so far treatment has resulted in great success.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 1035; ²*Ann. of Surg.* 1925, May, 976; ³*Jour. Amer. Med. Assoc.* 1925, May 16, 1469.

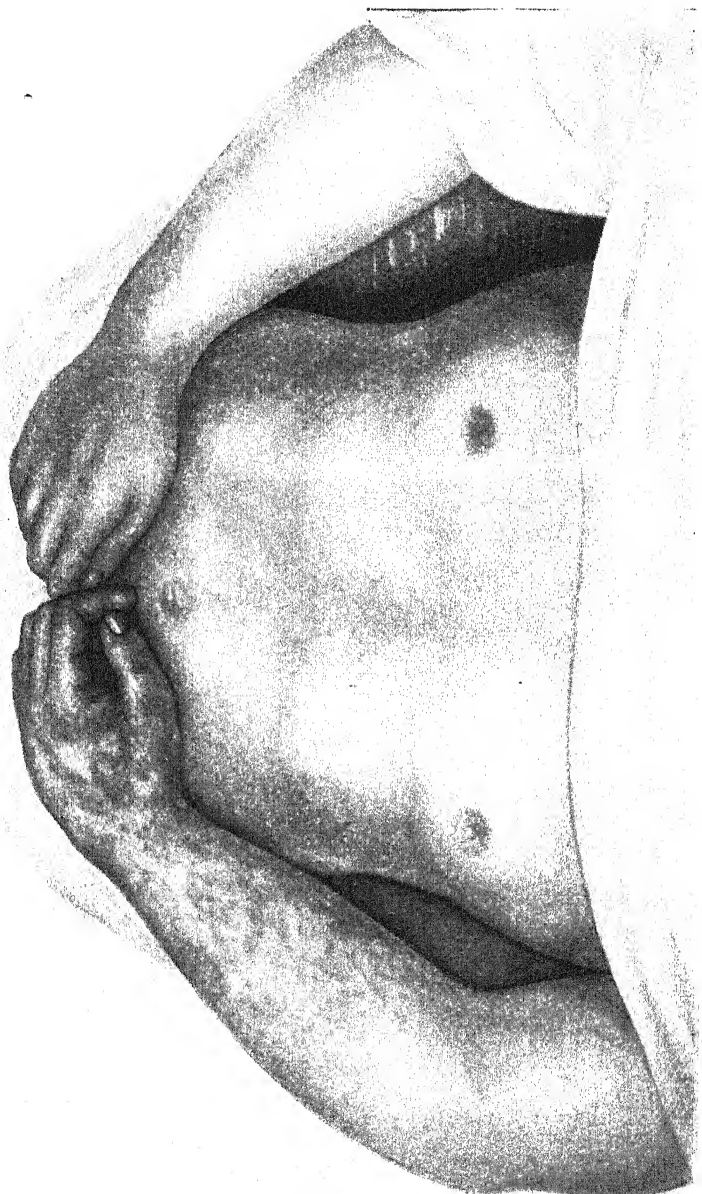
THROMBOSIS, ARTERIAL.

A. Rendle Short, M.D., F.R.C.S.

Three or four cases have come under the writer's notice during the past year or two of massive arterial thrombosis occurring in the subclavian, axillary, and smaller arteries of the arm as a sequel to pneumonia. The cases seen have all been in middle-aged people. The condition is readily recognized (*Plate LV*). The hand and arm become painful, swollen, and dusky, and no arterial pulsation can be felt in the radial, brachial, or axillary artery. Dry gangrene slowly develops, and the arm has to be amputated, just below the elbow in our cases.

In the patient figured, the axillary artery was cut down upon and opened, and the pressure of blood forced out a long clot which had evidently blocked

PLATE LV.
ARTERIAL THROMBOSIS



the subclavian artery as far back as the junction of the second and third parts. The incision was sutured and made watertight with very fine oiled silk, but unfortunately it proved that the whole of the brachial down to its smallest branches was full of clot, and gangrene was not averted.

THUMB, REPLACEMENT OF LOST. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

In certain cases when a patient has been deprived of his thumb as a result of a machinery accident or wound, it may be possible by operative methods to provide a substitute. Joyee¹ reports a remarkable case in which the ring finger of the opposite hand was substituted for a lost thumb. The operation in this successful case was described under the following headings: 1st step: Preparation of the bed for the reception of the new metacarpal bone; the exposure of the proximal end of the divided tendons of the old thumb. 2nd step: Dislocation of the ring finger of the opposite hand at the metacarpophalangeal joint, involving division of the soft tissues at the base of the radial side of the proximal phalanx; division of the extensor and flexor tendons, and the preservation of the nutritive flap on the ulnar side of the finger. 3rd step: Fixation of the new metacarpal bone (proximal

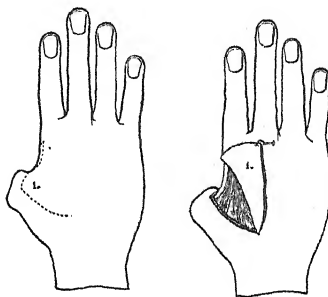


Fig. 51.—Line of incision and dissection of dorsal triangular flap with the second metacarpal as a base. 1, Dorsal pedicle.

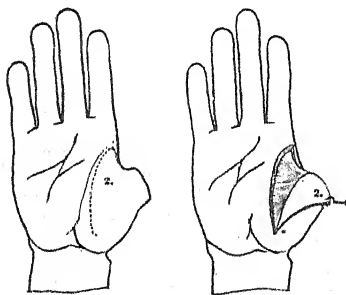


Fig. 52.—Line of incision and dissection through the triangular fleshy part of the palm with the first metacarpal as a base. 2, Palmar pedicle.

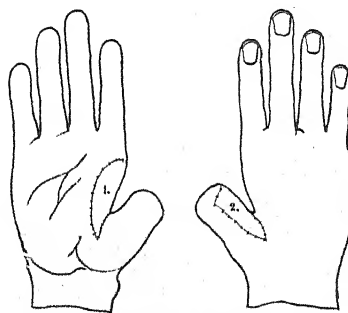


Fig. 53.—Result of operation. 1, Dorsal pedicle; 2, Palmar pedicle.

(Figs. 51-53 re-drawn from 'Surgery, Gynecology, and Obstetrics'.)

phalanx of ring finger) in its bed; union of tendons to stump; suture of incisions and fixation of the hands in apposition. 4th step: Division of nutritive flap two months later.

Bosch Arana² discusses a case in which the first metacarpal bone was mobilized in such a way as to produce a useful substitute for a lost thumb (Figs. 51-53.) The object of the operation was to produce a short thumb—one which could be used to seize objects, and at the same time the resultant stump would form a base for an artificial substitute. A flap of skin and

aponeurosis the shape of a right-angled triangle was lifted up from the dorsal aspect of the stump. This exposed the muscle fibres in the first dorsal interosseous space. A somewhat similar flap was raised from the palmar aspect. The third step of the operation consisted of the resection of the adductor muscles; the entire transverse adductor muscle was extirpated. In the fourth step there was muscular resection of the interosseous space. "These four fundamental steps having been carried out, we were able to sever the relation between the first and second metacarpals, that is to say, we severed the intermetacarpal muscular barriers and rendered the metacarpal of the thumb independent and gave it free action. In fact, the thumb could be moved adductively by the adductor of the thumb, because the carpal fasciculus of the thumb had not been extirpated; it will move abductively through its own muscles which were uninjured; and lastly, it will have oppositional movement because this muscle remains unmodified by the operation.

"Fifth step: Skin moulding: Maintaining complete hæmostasis of the few insignificant arterioles, we proceed with the skin moulding by carrying the dorsal pedicle toward the surface of the palm, thus covering the second metacarpal. In turn we passed the palm pedicle over toward the back surface, thus covering the first metacarpal. Both pedicles are crossed through the intermetacarpal space, and their edges must correspond with the respective edges of the palm or back of the hand, since the dimensions are noticeably alike, and they must be carefully sutured so as to obtain a speedy healing".

The artificial thumb has perfect movements of abduction and opposition.

REFERENCES.—¹*Brit. Jour. Surg.* 1918, v, Jan., 499; ²*Surg. Gynecol. and Obst.* 1925, June, 857.

THYROID GLAND, DISEASES OF.

Francis R. Fraser, M.D., F.R.C.P.E.
T. P. Dunhill, C.M.G., M.D.

Anatomy and Physiology.—Since the isolation of thyroxin by Kendall,¹ in 1914, the most important contribution to the knowledge of the functions of the normal gland is the conception brought forward by Williamson and Pearse.² They conceive of the gland as composed of units, each of which consists of a column of epithelium surrounded by a lymph sinusoid. They trace two functional activities of this unit. From an indifferent or resting state the column may pass into vesiculation, in which state there are accumulations of colloid distending the column and forming discrete vesicles; or it may pass into an active secreting phase, in which the cells show signs of activity, and a secretion, which is not colloid, accumulates in the centre of the column and distends intra-epithelial tubules, and the potential spaces of the sinusoid. Colloid, they state, is not the active secretion, though it may be a vehicle for the carriage of some metabolite.

Classification of Pathological Conditions.—A classification of the diseases due to disturbances of the thyroid gland cannot yet be framed on an etiological basis, nor on the deviations from the normal histology and physiology; but in our present state of knowledge the clinical conditions can be conveniently considered under the following headings: (1) Cretinism and myxœdema. (2) Simple goitre: (a) Hypertrophic; (b) Diffuse colloid; (c) Adenomatous. (3) Goitre with symptoms of intoxication: (a) Primary Graves' disease; (b) Secondary Graves' disease. (4) Malignant disease.

Such a classification omits any mention of thyroiditis, a process which may result in myxœdema and of which there are probably many causes. One type of thyroiditis that has frequently been mistaken for malignant disease will be discussed in connection with surgical procedures.

Cases are met with that show characteristics of two or more of these types, and at one time an individual case may clearly belong to one type and at another time show the definite characteristics of another type.

Pathology.—The histology of pathological conditions of the thyroid gland has been extensively studied by Williamson and Pearse,³ who base the interpretation of their findings on their conception of the anatomy and physiology of the normal gland referred to above. In the meantime their pathological types cannot be correlated exactly with clinical diseases.

1. **CRETINISM.**—Naish⁴ has drawn attention to the important differences between endemic and sporadic cretinism, and considers that while sporadic cretinism is due to lack of thyroid in the individual, endemic cretinism is less simple in its causation. Changes in the mothers' thyroid gland affect the development of the fetus fundamentally, he suggests, giving rise to a more variable clinical picture and a less favourable response to treatment.

2. **SIMPLE GOITRE.**—The recognition that the main function of the thyroid gland is to produce thyroxin, an iodine-containing hormone which provides for a higher rate of metabolism than is possible in its absence, and the good results obtained by the administration of iodine in prevention and treatment, have concentrated attention on the relation between iodine and these forms of goitre. They are believed by most workers to be dependent on an iodine deficiency. Probably they should be classed with myxœdema as manifestations of thyroid deficiency (Marine⁵).

Hypertrophic, adenomatous, and diffuse colloid goitres are regarded as essentially deficient glands, developing their special characteristics under the influence of a variety of etiological factors. Of the factors directly concerned with iodine deficiency, McCarrison⁶ recognizes two types: (1) Disturbance at the threshold of absorption, and (2) Disturbance at the threshold of utilization. In the first type he considers iodine deficiency in soil, water-supply, and food. The iodine intake may be sufficient for healthy people, but gastro-intestinal infections may interfere with its adequate absorption, and uncleanly or unhygienic conditions of the body may so alter the thyroid gland or the blood that the iodine absorbed is not properly utilized for the manufacture of the hormone. In animals, an excessive ingestion of proteins or of certain fats can cause hyperplastic changes in the thyroid gland, and McCarrison suggests that this may be presumed to be a factor also in the etiology of simple goitre in man. This hyperplasia can be prevented by the proper administration of iodine, as can also the goitres produced experimentally by the excessive ingestion of calcium. The possibility of some of these factors operating at the threshold of utilization of the hormone in the tissues must not be lost sight of, as McCarrison points out. Marine⁵ states, as the result of much experimental work on animals as well as observations on human cases, that the immediate cause of thyroid enlargement is a relative or an absolute deficiency of iodine.

If iodine deficiency must be regarded as an etiological factor common to the different forms of simple goitre, a study of geographical distribution and age incidence reveals clear distinctions.

Enlargements of the gland due to a simple *hypertrophy*, unaccompanied by symptoms, usually of a temporary character, and occurring endemically and sporadically, are frequently seen in adolescence, pregnancy, lactation, the climacteric period, and infections. Marine considers that at these periods there is an increased need for iodine, and this form of goitre must be regarded as the reaction of a deficient gland to a physiological stimulus.

Adenomatous goitre in an endemic form is found in the great mountainous regions of the world; its incidence is low in childhood and increases with

advancing age; and it is often associated with cretinism in the children of the goitrous mothers.

Diffuse colloid goitre is most often found in lowland districts; its incidence is high in the early years of adult life; and it is commonly associated with exophthalmic goitre in the same localities.

De Quervain¹⁸ considers that the hypertrophic goitre of children may develop into the diffuse colloid goitre on the one hand, or it may develop widespread histological changes suggesting exaggerated activity, but without symptoms of increased activity, on the other. The latter type is frequently found in the goitre of puberty. Gradually in either form the changes may cease to be diffuse, fibrosis may develop, and the gland in the adult may show the characteristics of a nodular (adenomatous) goitre. The etiological factors accounting for the development of a colloid goitre in one individual, and an adenomatous goitre in another, in response to iodine deficiency, are still obscure.

Both the colloid and the adenomatous forms occur sporadically as well as endemically; but it is not certain that the sporadic goitres seen in Great Britain develop in the manner traced by de Quervain in the endemic goitres.

3. GOITRES WITH SYMPTOMS OF INTOXICATION.—The term hyperthyroidism is frequently used in the same sense as the term intoxication is used here, but the difficulties in the way of accounting for all the symptoms by excessive normal secretion make the latter term preferable. The separation by Plummer⁷ of the cases of adenoma with hyperthyroidism, or 'toxic adenoma', from the cases of typical exophthalmic goitre, was an important step towards the recognition that there are more diseases than one of the thyroid gland with symptoms of intoxication; and it is now recognized that, while the cases of typical exophthalmic goitre with diffuse hyperplasia of the gland form a clearly defined group, symptoms of intoxication may appear to various degrees in cases in which the thyroid glands show the histological characteristics of diffuse colloid or of adenomatous goitres. These glands show histologically the presence to a greater or less degree of the hyperplasia which is characteristic of exophthalmic goitre, so that the presence of hyperplasia has an intimate relationship to intoxication. Williamson and Pearse⁹ have laid stress on the presence of coarse or fine fibrosis in the glands of cases showing symptoms of intoxication which do not belong to the group of typical exophthalmic goitre. Their adoption of the terms 'primary Graves' disease' for the cases of typical exophthalmic goitre, and 'secondary Graves' disease' for those of intoxication with glands showing fibrosis, adenomata, or other changes, with hyperplasia in addition, has much to be said in its favour. Their term 'secondary Graves' disease' would thus include the 'toxic adenoma' of Plummer, 'forme fruste Basedowii' of the French writers, 'toxic adenomatosis', and 'toxic goitre'.

The cause of primary Graves' disease, and of the appearance of the symptoms of intoxication in secondary Graves' disease, is still unknown. Kendall⁸ believes that, while the administration of thyroxin can reproduce the symptoms of 'toxic adenoma', it cannot reproduce those of typical exophthalmic goitre, and considers that in 'toxic adenoma' there is hyperthyroidism, but that typical exophthalmic goitre is a dysthyroidism. Many cases, however, that must be classed among those of 'adenoma with toxic symptoms' show the full picture of typical exophthalmic goitre, so that the explanation cannot be as simple as this.

In all forms of intoxication, exacerbations occur during pregnancy and lactation and with the onset of infections, so linking these forms of goitre with the simple goitres. Psychic disturbances appear in many cases to be the exciting cause.

The relation of iodine to goitres with intoxication has been the subject of much work recently. Although most of the observations have been made from the point of view of treatment, certain facts bearing on pathology emerge. Plummer⁹ considers that iodine converts the *dysthyroidism* of exophthalmic goitre into hyperthyroidism. Cowell and Mellanby¹⁰ consider that there is in exophthalmic goitre some factor causing iodine to be withdrawn from the gland so that it becomes hyperplastic, and that iodine cannot be considered as curative. Fraser¹¹ considered the results of iodine treatment as indicative merely of the presence in exophthalmic goitre of an iodine deficiency relative to the needs of the body. Cattell,¹² as the result of chemical and histological studies, concluded that iodine therapy causes a return of the hyperplastic gland to the normal or resting state to a greater or less extent, and an increase in the iodine content of the gland, which has long been known to be low in exophthalmic goitre. He states that the existence of glands showing a complete return to the resting stage as the result of iodine therapy "in patients with a high basal metabolic rate and severe symptoms, suggests an extra-thyroid phase of exophthalmic goitre". Crile¹³ states: "We know of no specific pathologic basis for the syndrome that we designate 'hyperthyroidism'". There is, therefore, a general agreement that, although there is an iodine deficiency in goitres with symptoms of intoxication, the iodine deficiency is not the cause of the goitre in the sense in which it is the cause of simple goitre, and that the basic cause of goitres with intoxication is still unknown.

From the mortality returns of the Registrar General, Campbell¹⁴ has shown that there is a definitely increased mortality in the Western Counties of Great Britain as compared with the rest of the country. This indicates an endemicity for which at present there is no explanation.

MEDICAL TREATMENT AND PREVENTION OF GOITRE.

1. **Cretinism and Myxœdema.**—Reid Hunt¹⁵ has examined numerous commercial preparations of **Thyroid Gland** by means of the biological test dependent on the altered toxicity of acetonitrile in mice, and found that they vary greatly in therapeutic activity. Some were adulterated with non-thyroid iodine. The activity of fresh glands also varies, and since commercial preparations are usually labelled in reference to their value in terms of iodine content or of fresh gland, the labels do not convey information of use in comparing dosages of different preparations. Dosage, therefore, must still be largely empiric.

Naish^{4,16} states that the treatment of cretinism with thyroid extract is not always easy, as in certain cases the toxic effect lies very close to the remedial effect. Although true endemic cretinism is not found in England, Naish points out that instances of sporadic cretinism occur with features suggestive of the endemic type, and with a relative serious prognosis. In general the earlier the treatment is commenced, the better the result; but in many cases treatment only results in a troublesome idiot instead of a log-like imbecile.

Fahr¹⁷ draws attention to the condition of the heart in cases of myxœdema, and concludes that there are objective and subjective signs of heart failure which do not respond to rest and digitalis, but which are cured by thyroid therapy. There is a dilatation of all the chambers of the heart, and the electrocardiographic records show characteristic changes. These changes also disappear after thyroid medication.

Martin Englander¹⁸ finds in cases of the 'forme fruste' of myxœdema—the incomplete forms or latent cases in which thyroid medication is not always satisfactory—that the administration of **Iodine** causes great improvement. He gives 40 to 60 drops daily of a 0.01 per cent solution of **Potassium Iodide**.

2. **Simple Goitres.**—The treatment of simple goitre is based on what is known

of the pathology (*see above*), and consists in eradicating all foci of infection, in instituting cleanly and hygienic habits, in adopting well-balanced diets, and in the administration of **Iodine**. The study of the histopathology of simple goitres that have existed for any length of time indicates that the enlargement must be to a considerable extent permanent, and that no form of treatment other than surgical can remove the swelling in the neck. A recognition of this fact, and of the close relation between cretinism and goitre in the mothers, and the experimental evidence that goitre in animals can be prevented by the administration of iodine, have directed attention to prevention rather than treatment. As Marine⁵ points out, simple goitres most frequently develop (a) in foetal life, (b) in adolescence, and (c) during pregnancy and lactation. Since the first attempts by Marine and Kimball¹⁹ to prevent adolescent goitres by the administration of iodine to school children, many records have appeared in the literature of prophylactic measures in areas where goitre is endemic.

Prevention and Treatment by Iodine.—Steinlin²⁰ reviews the status of the campaign in Switzerland. In ten cantons and five half-cantons **Iodized Table Salt**, containing 0.5 grm. of iodine in 100 kilo., is now largely used, and in many places is the only form to be obtained. The results, he says, will be noticed chiefly in future generations, but the health authorities of the cantons of St. Gall and Appenzell already report good results. Hunziker²¹ discusses the widespread fear that iodine can cause a simple goitre to produce symptoms of intoxication, and considers that this result is very rare and is due to enormous over-dosage. After two years' experience of the use of iodized salt in Appenzell, he considers that no goitrous beings come into the world, and no new goitres develop, while a diminution occurs in all young forms of goitre and in some of the older. Eggenberger²² also supports the use of iodized salt. Hercus and Baker²³ report on the results in three schools in New Zealand. They gave weekly doses of 4, 2, or 1½ gr. of **Potassium Iodide**, according to age, for ten weeks; and of 1514 children, the goitres diminished in 35 per cent of the treated, and in 15 per cent of the untreated. In the treated the diminution occurred rapidly. Kaspar,²⁴ working in Vienna, gave potassium iodide and found the results especially good in children, and that the adolescent goitres diminished except in a few cases. He pleads for individual regulation of dosage, and constant oversight by a physician. Bleyer²⁵ also warns of the need for elasticity in dosage. Hamburger-Graz²⁶ recommends in children a combination of **Sodium Iodide and Thyreoidin**. Lill²⁷ used iodide in chocolate tablets for the administration to children in Wurtzburg. He gave one tablet a week for 40 weeks in the year, each tablet containing 3 mgrm. of iodine. Siemens²⁸ stresses the hereditary factor in goitre and other thyroid disturbances, and pleads for prophylaxis. Eckstein²⁹ gives small doses of iodine to infants with goitres causing suffocative symptoms, and finds a sure and rapid reduction in the size of the goitre. De Quervain³⁰ discusses the use of iodized table salt, and considers that the content of iodine should be regulated by the iodine deficiency in the local water and food supplies. He considers that toxic symptoms only result in individuals guilty of self-drugging. Marine,⁵ from an analysis of prophylactic measures in various countries, considers that the exclusive use of table salt containing 2 to 5 mgrm. of iodine per kilo. would seem ample for prevention in districts where endemic goitre is not very prevalent. He further advises that "all pregnant women living in goitre districts should be given the equivalent of 10 mgrm. of iodine each week during the period of pregnancy and lactation". The Swiss plan of giving tablets containing 5 to 10 mgrm. of iodine to school children at weekly intervals is, he thinks, quite sufficient for protection. He considers the possibility of injury

is negligible, but that the possibility of aggravating incipient exophthalmic goitre is worthy of consideration.

It may therefore be concluded that the use of iodine can prevent the development of simple goitres, and that once a goitre is present iodine administration will diminish its size in the early stages in many cases; but when the goitre has been present for any length of time it is efficacious in some cases only. It is probable that the further development of the enlargement can be checked in cases that already have had goitres for some length of time.

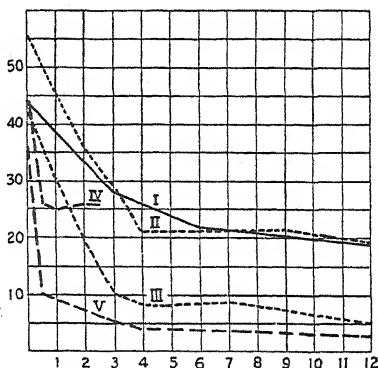
Surgical treatment is only indicated when symptoms of mechanical pressure arise, or for unsightly deformities.

3. Goitres with Symptoms of Intoxication.—

a. PRIMARY GRAVES' DISEASE.—This is the typical exophthalmic goitre, which occurs as a rule at a younger age than the secondary forms, and which is associated with a diffuse hyperplasia of the thyroid gland. Barker³¹ says that the average duration of this form of hyperthyroidism "is probably two or three years, no matter how you treat it". Read³² considers that it runs a fairly definite course, and that if the duration is estimated from the crest of the first wave of toxicity, it "varies from six months to three years, the

Fig. 54.—Curves showing variations in the average basal metabolic rate in groups of patients under different forms of treatment.

Curve I (from Kessel, Lieb, and Hyman): Composite curve of metabolic rates in patients untreated except by rest. Curve II: Composite curve of all cases treated by X rays at the Massachusetts General Hospital. These cases were followed one year. Curve III: Composite curve of five cases showing striking improvement following X-ray treatment. Curve IV: Curve showing effect of removing one-half of the thyroid gland (hemithyroidectomy). Curve V: Curve showing effect of subtotal thyroidectomy. (Figs. 54, 55 reduced from the 'Boston Medical & Surgical Journal'.)



average being from fifteen to eighteen months". Hyman and Kessel³³ claimed to have studied the natural course of the disease in fifty patients who received no other treatment than rest and other general procedures, and concluded that in judging of any therapeutic procedures consideration must be given to the natural subsidence of the condition. They found that 83 per cent rapidly improved so that they could return to work of economic value; they were not cured, and during two years of observation had exacerbations that temporarily incapacitated them. The basal metabolic rate is accepted as the best quantitative indication of the severity of the disease, and Read publishes composite curves showing that the course is much the same whether X rays, surgery, or general medical measures are employed. Holmes, Means, Porter, Richardson, and Starr³⁴ confirm this in general, but show that surgical treatment by subtotal thyroidectomy has a very definite effect on the course; and that although treatment by X rays in the average case modifies the course but little, in a few cases the effect is nearly as great as that of subtotal thyroidectomy. This is shown in Fig. 54; the curves therein are constructed from observations made before iodine was reintroduced. Even if the disease subsides after running a fairly definite course it is often sufficiently severe to

render the patient incapable of continuing at work, and the economic conditions of the patient frequently necessitate a return to work at the earliest possible moment. In addition, the cardiac complications may be so severe as to necessitate the employment of therapeutic measures to save the patient from crippling cardiac disturbances.

Iodine.—Plummer and Boothby^{9,35} were the first to publish observations on the reintroduction of Iodine, which had been little used for many years. They used Lugol's Solution (5 per cent iodine in 10 per cent aqueous solution of potassium iodide) in doses of five or ten drops three times a day, and found a rapid fall in the basal metabolic rate and in the severity of the intoxication. If not tolerated by the stomach it can be given per rectum. Cowell and Mellanby,¹⁰ Mason,³⁶ Jagie and Spengler,³⁷ Starr, Walcott, Segall and Means,³⁸ Fraser,¹¹ Buchanan,³⁹ Jackson,⁴⁰ and others have reported similar results. Cowell and Mellanby used potassium iodide, Jagie and Spengler used sodium iodide, and Fraser used the 10 per cent tincture of iodine in 95 per cent alcohol. Means and his co-workers describe the effect as the 'iodine remission', and show that it "is often as rapid and extensive as that following subtotal thyroidectomy" (Fig. 55). If the iodine is stopped, "a rise of metabolic rate and

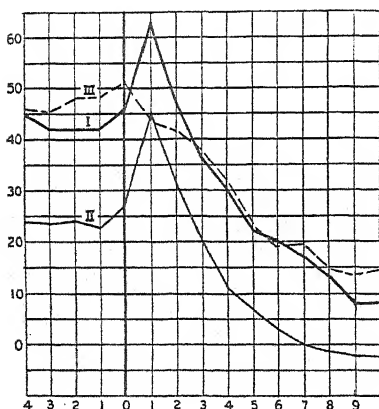


Fig. 55.—Composite curves of basal metabolic rate showing fall following subtotal thyroidectomy and use of iodine. Note that in this figure the time is expressed in days instead of months as in the previous figure.

Curve I: Rate of fall following subtotal thyroidectomy in a group of cases having an average pre-operative basal metabolic rate of plus 42 per cent. Curve II: Rate of fall following subtotal thyroidectomy on a group of cases having an average pre-operative basal metabolic rate of plus 24 per cent. Curve III: Rate of fall in eight cases showing a marked effect from the administration of iodine (Lugol's solution).

increase of toxic symptoms will occur within one or two weeks", and the effect of subsequent administration is not so marked as with the first course of iodine. Cowell and Mellanby find that the improvement reaches a maximum in from ten to twenty days, and is frequently followed by a gradual return of symptoms even when the iodine is continued (Fig. 56). Fraser found that the improvement does not as a rule persist, and that if too large a dose is employed the patient may be made worse. He considered that increasing hardness of the gland is an indication for a smaller dosage. All authors are in agreement that the heart-rate falls and body-weight usually rises with the fall of the metabolic rate, that there are cases that fail to show the typical striking improvement, and a few that do not seem to be benefited, and that treatment with iodine is in no sense a cure. Cattell¹² and Jackson⁴⁰ have shown by histological studies that accompanying iodine treatment there is a reversion from the diffuse hyperplasia to the colloid-storing phase. Iodine treatment, therefore, in small doses, such as those recommended by Plummer and Boothby, causes a striking remission in the severity of the intoxication, and can so improve the condition, even if temporarily, that surgical treatment by means of partial

thyroidectomy becomes simpler and safer. Fraser further considered that "if a patient can afford to lead a sheltered life it is a valuable addition to the other means at our disposal for managing a condition that in the majority of cases gradually subsides in time".

X Rays.—Holmes, Means, Porter, Richardson, and Starr³⁴ found that in a third of the cases treated by X Rays there was no evidence of improvement, and that in the remaining two-thirds the improvement is little better than Kessel and Hyman³³ maintain is to be expected from the natural course of the disease. They find, however, striking improvement in a few instances (see Fig. 54), and consider that in cases that require active treatment and in which surgical treatment is refused, X-ray therapy should be given. If any benefit is to take place at all, they say, it ought to be apparent within

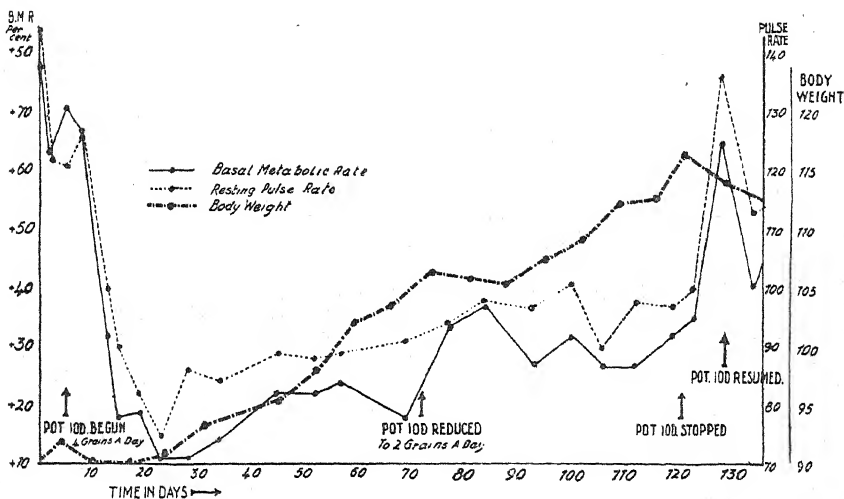


Fig. 56.—The pronounced fall in the basal metabolic rate and pulse-rate during the first three or four weeks of the iodide administration is succeeded by a gradual rise. Withdrawal of the iodide after four months is quickly followed by a considerable rise in the basal metabolic rate, accompanied by a fall in weight. (Re-drawn from the 'Quarterly Journal of Medicine'.)

four months. Groover, Christie, and Merritt⁴¹ quote cases illustrating successful results.

Insulin.—Lawrence⁴² treated four severe cases with Insulin, and in two of them concluded that the great improvement that occurred was the result of the treatment.

Psychotherapy.—Maranon⁴³ believes that most of the remedies for hyperthyroidism, perhaps even the physiotherapeutic and operative methods, owe some efficacy to psychotherapy.

General Management.—In reviewing the procedures that should be adopted, Read³² emphasizes his belief that although rest in bed should be insisted on when the patient first comes under observation, the amount of rest should be varied according to the degree of toxicity and cardiac state. As improvement takes place, restlessness develops, and the patient feels better if allowed to do something. Avoidance of mental stress, such as that due to worry and responsibility, is even more important than rest in bed. Little improvement will result until septic tonsils are removed, any focus of infection cleared up,

and constipation corrected. The diet must be liberal, and in the present state of knowledge should be well balanced. If these measures, combined with the administration of iodine, do not cause a well-marked improvement in a few months, the consensus of opinion is in favour of surgical treatment by means of subtotal thyroidectomy. The length of time during which treatment should be confined to non-surgical procedures must depend on the rate of improvement, the economical conditions of the patient, and on the danger of crippling damage to the myocardium. The cardiac disturbances are discussed below.

b. SECONDARY GRAVES' DISEASE.—Because of the varied conditions of the thyroid in which secondary Graves' disease may develop, it is a less clearly defined condition, and waves of intoxication of different degrees of severity may occur over a long period of years, with intervals of absolute freedom or of moderate intoxication only. This form of intoxication is more frequent in older patients. This fact, and the usually longer period of intoxication, may account for the higher incidence of serious cardiac damage. The treatment is the same as in the primary form, except that iodine may be expected to have less effect, if any, and that the more serious cardiac damage demands an earlier resort to surgery. Further, the probability of a recurrence of waves of intoxication demands less hesitation in advising surgical treatment.

Cardiac Disturbances.—Wilson,⁴⁴ after discussing the mechanism of the tachycardia, states that, of the cardiac complications, enlargement is one of the most important. The enlargement is due chiefly to dilatation, but hypertrophy is not infrequent. Sinus arrhythmia and extrasystoles occur, but not commonly compared with their incidence in other diseases causing myocardial damage. Thyroid intoxication, however, commonly gives rise to auricular fibrillation. This is sometimes seen as a transient phenomenon immediately after operation. A persistent enlargement of the gland, even if non-toxic at the time of examination, is, according to Wilson, at least a potential menace to the myocardium. Dunhill, Fraser, and Stott⁴⁵ studied 15 cases of auricular fibrillation in thyrotoxic conditions, and point out that the irregularity may be a transient phenomenon. In some cases it is present and persistent when the evidence of intoxication is slight. After surgical treatment there may be a spontaneous return to a normal cardiac rhythm, but if the irregularity persists after operation, the return to a normal rhythm may be brought about by the administration of *Quinidine*. Hamilton⁴⁶ points out that heart failure with congestion may occur as the result of the myocardial damage due to thyroid intoxication, and that in these cases the causative thyroid factor is often overlooked. The heart symptoms may occur as an apparently unassociated disorder in cases that have had enlargement of the thyroid gland for many years without symptoms. Read,³² and Wilson,⁴⁴ note that *Quinine* is of value in quieting the subjective throbbing of the heart, even when the rhythm is regular. *Digitalis* has little or no action on the regular tachycardia of thyroid intoxication, and Wilson points out that there is justification for the general opinion that the ventricular rate is less easily controlled in thyrotoxic auricular fibrillation than in the auricular fibrillation due to other types of heart disease. In many instances, however, the ventricular rate can be controlled just as well as in other diseases. When heart failure is present, complete rest and *Digitalis* should be given. If symptoms of intoxication persist in a case that has had heart failure, or in which auricular fibrillation is present, surgical treatment alone offers hope of restoration to economic efficiency. Hamilton quotes 11 cases of heart failure with congestion that, with one exception, lost all signs of heart failure after operation. Dunhill⁴⁷ quotes 16 cases of auricular fibrillation that he operated on, in 11 of which

there was spontaneous return to a normal rhythm at intervals up to three months after operation; in 3 others the normal rhythm was restored by the administration of quinidine; in 1 case he considers that sufficient gland was not removed, as symptoms of moderately severe intoxication were still present after operation; and the remaining case had a severe degree of heart block in addition to the auricular fibrillation, and died, possibly as the result of quinidine.

SURGICAL TREATMENT OF GOITRE.

1. **Simple Goitre.**—Operative procedures for simple adenomatous and for diffuse colloid goitre scarcely call for review, except that for the latter the operation is so planned that, as well as removing the portions of gland which are causing pressure symptoms, the prominent part of each lobe is removed, thus leaving a symmetrical neck.

2. **Goitre with Signs of Intoxication.**—The surgical procedures in these cases will be discussed under three headings: (a) Selection of cases and preliminary treatment; (b) Technique; (c) End-results.

a. **SELECTION OF CASES AND PRELIMINARY TREATMENT.**—During the period under review there has been growing a surer knowledge of some of the factors which influence the condition of the patient. Attention to these has not only made the operation safer, but has made it possible to restore the patient ultimately more nearly to a normal state of health.

One of these factors is the more general appreciation of the effect of toxic foci on the thyroid gland. Although this had been the subject of investigation years ago by Rupert Farrant and others, patients have too frequently been treated for long periods by all the usual methods without attention being directed to obvious septic processes. It is being more widely realized that much improvement can be made in a patient's state by getting rid of these conditions, and attention to this should precede every method of treatment,

A second factor is the administration of Iodine in appropriate doses for a period preceding operation. In 1923 Plummer^{9,35} demonstrated the value of this, indicating the dosages that had proved suitable in different conditions, and the time at which the optimum result is attained. His researches showed that the drop in the basal metabolic rate, the decrease in the pulse-rate, and the increase in body-weight are directly due to the administration of iodine. Ten minims of Lugol's solution in water, followed by a glass of water, given once a day, is usually sufficient, and the drop in metabolic rate and pulse-rate may reach a maximum in ten days. Sometimes it takes longer—up to three weeks—before the maximum result is obtained. Plummer kept his patients in bed before commencing iodine treatment until the gain from rest alone had been assessed. The preliminary iodine medication reduced the operation risk greatly. In patients with severe vomiting, larger doses are given—thirty drops several times a day, sometimes by rectum—until the vomiting ceases, and then the usual dose is continued. Approximately two-thirds of the patients with exophthalmic goitre are improved greatly, one-fourth are slightly benefited, and about one patient in twenty is not benefited. In the Mayo Clinic, for five years up to 1922, on an average 15 patients died each year before any operation was possible. In the first nine and a half months of 1923, after iodine treatment had been introduced, only 4 patients died before surgical intervention was possible. Although iodine gives this striking temporary improvement in the patient's condition, and renders operation safer, it has not yet been proved that a permanent cure can be obtained by iodine medication alone. The value of this work has been widely tested. Arnold Jackson⁴⁰ has found that the result begins to be evident on the second or third day, and he has now reduced his pre-operative treatment to five days or less in the

majority of cases. This reduction of time seems to be unwise in hospital practice. It is different in private practice, where the surgeon knows his patient well and the investigations and preliminary treatment have been carried out previously.

Clute,⁵⁰ reporting the work in the Lahey Clinic, emphasizes the value of preliminary rest in hospital so that the patient may become accustomed to the nurses and hospital routine, and in order to give time for efficient investigation. In this clinic *Scopolamine* gr. $\frac{2}{100}$ and *Morphine* gr. $\frac{1}{4}$ are given two hours before, and repeated one hour before, operation. This is to eliminate as much as possible the psychic disturbance incidental to the operation. The principle is sound, but it is doubtful whether quite so much opiate is necessary. Excess of opiate tends to induce subsequent vomiting, and this, according to the paper, is not unexpected in the Lahey Clinic.

Walton⁵¹ has pointed out that owing to the well-known fact that patients suffering from toxic goitre tolerate heat badly, it is unwise to operate during very hot weather.

Very few patients are now refused operation, but the choice of the time and attention to the appropriate preliminary treatment have become much more rigid in recent years. Even patients who are in one of the acute crises which occur in the course of the disease can generally be quieted sufficiently by the means indicated above. Old-standing cases with decompensated heart—auricular fibrillation and œdema—can, with appropriate preparation, be rendered capable of undergoing an operation which with subsequent treatment will give them a considerable measure of health (*see below*). The preliminary treatment for these patients includes rest in bed, elimination of septic foci, and medication with digitalis, iodine, and, possibly, quinidine (Dunhill, Fraser, and Stott,⁴⁵ Dunhill⁴⁷). Mania is a definite contra-indication to operation. Mental agitation can usually be controlled, but when this has progressed to such an extent that it cannot be controlled, operation should not be performed. Glycosuria and blood-pressure are discussed later.

Toxic Adenoma.—Plummer⁷ first differentiated the toxic condition due to changes in old-standing adenomata from true exophthalmic goitre. These changes may occur after an adenomatous condition has been present for about fifteen years. A cardiovascular disturbance gradually develops, the nervous symptoms and eye signs being slight in comparison. The cardiac condition not infrequently results in auricular fibrillation. The basal metabolic rate is raised. The part of the gland not affected by the adenomatous mass remains practically normal. Removal of the adenomatous mass is tolerated with less disturbance than occurs in operation upon a patient with exophthalmic goitre, probably because the seat of the toxic process is more completely confined within the capsule of the adenomatous mass and is thus completely removed, while the remaining portion of the gland, being practically normal, is not stimulated to toxic activity by the surgical procedures.

b. *TECHNIQUE.*—Since the introduction of the treatment with iodine, fewer preliminary ligations are necessary, and more patients are able to tolerate the subtotal operation at one time with safety. It is now accepted that sufficient of the diseased gland must be removed to obtain the desired result—always having regard to the amount that it is necessary to leave for physiological purposes. No hard-and-fast rule can be laid down as to how much must be removed, but there is no question of resecting one lobe and expecting a patient to be cured. Practically all of one lobe, the isthmus, and from half to two-thirds of the second lobe should be taken at one or more operations. The surgeon must train himself, as de Quervain⁴⁸ points out, to be able to recognize macroscopically the quality of gland tissue in relation to the symptoms and

condition of the patient, and to judge how much may be done at one operation, as well as how much should ultimately be left.

More care is being directed to the protection of the recurrent laryngeal nerve and the parathyroid glands, and this is achieved by the method first planned by C. H. Mayo and further noted by Halstead, of leaving a small strip of tissue along the posterior border of the lobe which is being most extensively resected; and always by a meticulous regard for tissue planes.

Post-operative troubles are best treated by judicious selection of the time for operation in each case, by pre-operative care, and by adjusting the operative procedures to the patient's strength. Lugol's solution should be continued immediately after the operation.

c. END-RESULTS.—Ochsner,⁵² from an analysis of the first 500 replies to a questionnaire addressed to 1200 patients operated upon more than fifteen months previously, discusses, among other questions, those of high blood-pressure and glycosuria. If the systolic blood-pressure is above 200 mm. of mercury, preliminary treatment is given. Operation is not performed unless the systolic pressure can be brought below 190. In 11 patients whose pressures had been above 200 it fell quickly after operation below 150 and remained low. In 2 others, death subsequently occurred from apoplexy, and in 20 others the reduction in pressure was no more than would have occurred from general hygienic measures.

Glycosuria was present in traces in 5 per cent of Ochsner's cases. It was eliminated by appropriate treatment, and subsequent to operation did not recur. Patients with a high percentage of sugar do badly: 3 died within a week of admission without surgery, 3 were sent home without operation, and 3 others improved sufficiently to have first a ligation and ultimately an excision, and have remained well. If patients can be rendered sugar-free, operation may be performed with great benefit. If they cannot be made sugar-free by medical means, operation is not performed.

Tinker,⁵³ discussing the question of exophthalmos, states that his impressions have undergone a radical change during the last five years. He realizes that if proptosis has been extreme the improvement is gradual, but that at the end of some years the improvement is considerable. In 31 out of 39 patients personally examined seven to fourteen years after operation, the eyes had become normal; and whereas he formerly told patients with very prominent eyes that the prospect of improvement was doubtful, on the basis of observation of later results he now tells them that they have at least three chances out of four of ultimately getting fairly normal eyes. This view—with photographs—was published by Dunhill⁵⁴ in 1917.

Lahey,⁵⁵ Dunhill, Fraser and Stott,⁴⁵ and Dunhill⁴⁷ have discussed the question of fully developed auricular fibrillation associated with hyperthyroidism and its response to surgical treatment. These papers have shown that the operation is by no means too dangerous, and that a high percentage of these derelicts have been restored to a measure of health to which they had long been unaccustomed. Incidentally the evidence produced in these papers helps to clear the disputed question as to where the toxins are elaborated which cause the cardiac disturbances in Graves' disease. The result attained in the establishment of a normal rhythm after a sufficient thyroidectomy is so evident and in many cases so permanent that, although the origin of the disease may be elsewhere, it would appear that the toxins which cause at least some of the signs are produced by the thyroid cells.

It has already been stated that, in the type of case called 'toxic adenoma', operation is not fraught with such anxiety. It is equally true that after operation the return to normal health is more complete. This is so even though

the cardiac condition may have been serious. The completeness of the recovery is probably due to the fact that the whole of the pathological part has been removed, and the remainder of the gland, not being involved in the pathological process, functions normally.

3. Malignant Disease.—Malignant disease of the thyroid gland has been discussed by Berry,⁵⁶ Trotter,⁵⁶ Walton,⁵⁶ and Dunhill.⁵⁶ Precise early diagnosis is not easy, but the presence of a recently noticed hard lump in the thyroid region at or after middle age should arouse suspicion, as should involvement of a recurrent laryngeal nerve, or the onset of dysphagia in a patient who has a goitre.

In about 1 per cent of adenomata removed at operation, malignancy is discovered on microscopical examination. In this type recurrence is often late. In several instances ten years had elapsed before it occurred. Berry states that, in his experience, the innocent variety of tumour which simulates malignancy is nearly always associated with a waxy pallor, indicating commencing atrophy. This waxy pallor is practically always absent from the patient who has true malignant disease at the early stage before the growth has penetrated the capsule.

Walton⁵⁷ discusses the difficulties of microscopical diagnosis of malignancy and gives an excellent résumé of the subject.

De Courcy⁵⁸ believes that, even if the diagnosis can be made clinically, death is hastened by operation. He believes that practically every case of carcinoma develops in an old adenoma, and he suggests that carcinoma of the thyroid would be eliminated in great part by the early removal of all adenomata. The statement that death is hastened by operation is not the general experience of surgeons. In some patients with dyspnoea, the bulk of the tumour has been removed, and subsequent treatment by deep X-ray therapy has given a surprising extension of life.

Gordon Bell⁵⁹ discusses the question of thyroid metastases from an apparently normal or benign gland, and the differences seen in the histological characters of these metastases. He believes that the sinusoidal character of the thyroid circulation has a direct bearing on the origin of benign metastatic tumours; but in considering their benignity due regard should be given to their destructive behaviour towards the surrounding bone, and a diagnosis not made on histological characters alone.

4. Chronic Productive Thyroiditis.—This name is given to a condition discussed by Armin V. St. George,⁶⁰ by Bernard Shaw and R. P. Smith,⁶¹ and by Scott Williamson and Pearce.³ The two former regard it as synonymous with the 'iron hard struma' of Riedel, the 'benign granuloma' of Ewing, and the 'ligneous thyroiditis' of Delore. Scott Williamson and Pearce, in their very illuminating paper, give it the title of 'lymphadenoid goitre'. It has also been noted by Berry and others. The condition is almost invariably diagnosed as malignant, and is associated eventually with the clinical signs of myxœdema. The tumour is often small and very hard, and dyspnoea is a marked symptom. Microscopical examination of the tissues resected showed them to be composed of fibrous tissue and round cells, with some evidence of acini in various stages of obliterative compression.

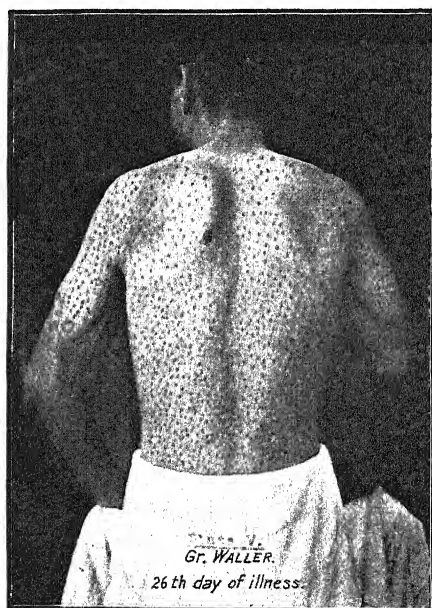
(See also LARYNX, DISEASES OF—VOCAL CORD PARALYSIS.)

REFERENCES.—¹*Trans. Assoc. Amer. Physicians*, 1915, xxx, 420; ²*Jour. Pathol. and Bacteriol.* 1923, xxvi, 459; ³*Ibid.* 1925, xxviii, 361; ⁴*Clinical Jour.* 1925, liv, 157; ⁵*Medicine*, 1924, iii, 453; ⁶*Brit. Med. Jour.* 1925, i, 1065; ⁷*Mayo Clinic Papers*, 1913, v, 447; ⁸*Harvey Soc. Lectures*, 1919-20; ⁹*Jour. Amer. Med. Assoc.* 1923, lxxx, 1955; ¹⁰*Quart. Jour. Med.* 1924, xviii, 1; ¹¹*Brit. Med. Jour.* 1925, i, 1; ¹²*Boston Med. and Surg. Jour.* 1925, xciii, 989; ¹³*Jour. Amer. Med. Assoc.* 1924, lxxxiii, 813; ¹⁴*Quart. Jour. Med.* 1925, xviii, 191; ¹⁵*Arch. of Internal Med.* 1925, xxxv, 671; ¹⁶*Lancet*, 1925, i, 90; ¹⁷*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 345; ¹⁸*Wien. klin. Woch.* 1925, xii,



PLATE LVI.

TICK-TYPHUS



Type and distribution of rash at height of disease (26th day). Whole body and extremities affected ; scanty on face.

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327; ¹⁹*Jour. Lab. and Clin. Med.* 1917, iii, 40; ²⁰*Schweiz. Zeits. f. Gesundh.* 1923, iv, 456; ²¹*Die Prophylaxe der grossen Schildkruse*, Berne and Leipzig, 1924; ²²*Münch. med. Woch.* 1924, xxix, 972; ²³*Proc. of Univ. of Otago Med. School*, 1924, ii; ²⁴*Wien. klin. Woch.* 1924, xxix, 713; ²⁵*Münch. med. Woch.* 1924, xlv, 1538; ²⁶*Ibid.* 1924, lii, 1815; ²⁷*Ibid.* li, 1791; ²⁸*Ibid.* 1789; ²⁹*Arch. f. Kinderheilk.* 1925, lxxvi, 7; ³⁰*Schweiz. med. Woch.* 1925, iv, 65; ³¹*Internat. Clinics*, 1924, i, 1; ³²*Jour. Amer. Med. Assoc.* 1924, lxxviii, 1963; ³³*Arch. of Surg.* 1924, viii, 149; ³⁴*Boston Med. and Surg. Jour.* 1924, cxcii, 295; ³⁵*Jour. Iowa Med. Soc.* 1924, xiv, 66; ³⁶*Canad. Med. Assoc. Jour.* 1924, xiv, 219; ³⁷*Wien. klin. Woch.* 1924, xxxvii, 116; ³⁸*Arch. of Internal Med.* 1924, xxxiv, 355; ³⁹*Med. Jour. and Record*, 1924, Dec., 599; ⁴⁰*Ann. of Surg.* 1925, April, 739; ⁴¹*Jour. Amer. Med. Assoc.* 1924, lxxviii, 1757; ⁴²*Brit. Med. Jour.* 1924, ii, 753; ⁴³*Rev. de Méd.* 1924, xli, 248; ⁴⁴*Jour. Amer. Med. Assoc.* 1924, lxxviii, 1754; ⁴⁵*Quart. Jour. of Med.* 1924, xvii, 326; ⁴⁶*Jour. Amer. Med. Assoc.* 1924, lxxviii, 405; ⁴⁷*Brit. Med. Jour.* 1924, ii, 611; ⁴⁸Translation from the French by Snowman, London, 1924; ⁴⁹*Lancet*, 1925, i, 759; ⁵⁰*Boston Med. and Surg. Jour.* 1924, cxcii, No. 25; ⁵¹*Lancet*, 1923, i, 53; ⁵²*Ann. of Surg.* 1924, Sept., 388; ⁵³*Ibid.* 383; ⁵⁴*Lancet*, 1917, ii, 883; ⁵⁵*Surg. Gynecol. and Obst.* 1924, July, 10; ⁵⁶*Proc. Roy. Soc. Med.* 1925, xviii, No. 5, 25; ⁵⁷*Lancet*, 1925, i, 650; ⁵⁸*Ann. of Surg.* 1924, Oct., 551; ⁵⁹*Brit. Jour. Surg.* 1924, xii, Oct., 331; ⁶⁰*Ann. of Surg.* 1924, July, 25; ⁶¹*Brit. Jour. Surg.* 1925, xiii, July, 93.

TIC DOULOUREUX. (See NEURALGIA, TRIGEMINAL.)

TICK-TYPHUS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

J. W. D. Megaw¹ reviews the prevalence of this fever in India, and with F. B. Shettle and D. N. Roy² records a further group of 9 cases occurring during military manoeuvres in the Central Provinces, 7 in Europeans and 2 in Indians. There was no apparent connection between the cases, although all had been exposed to tick bites in the jungle during their marches. The temperature charts, two coloured plates, and four photographs of the typhus-like rashes (Plate LVI) are given. The main clinical features are an incubation of one to three weeks, a step-like rise of temperature over four days, with headache and pains in the joints and limbs with the onset, and a rosy macular or papular rash appearing from the third to the fifth day on the limbs, spreading to the body, disappearing on pressure, becoming profuse and dark red or even hemorrhagic later, and sometimes involving the palms and soles. The fever, of a continued or remittent type, lasts twelve to sixteen days and falls by lysis, the disease occasionally ending fatally. The spleen and liver are often somewhat enlarged. The blood usually shows a moderate leucocytosis, but the Widal and Weil-Felix reactions are negative in most cases, and person to person infectivity does not occur, lice having been absent from the body and clothes. The disease therefore most closely resembles American Rocky Mountain tick-typhus, although that term is not quite applicable to a disease in India.

REFERENCES.—¹*Ind. Med. Gaz.* 1925, Feb., 53; ²*Ibid.* 58.

TOES, PAINFUL. (See FEET, PAINFUL.)

TONSILS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Effect of Operation.—Although operations for the removal of tonsils are very widely carried out, evidence as to their value is useful. A. D. Kaiser¹ has examined the effect of the operation on the general health of 1200 children as compared with that of an equal number who have not been operated on. The cases were examined three years after operation. He finds that tonsillectomy offers a child considerable relief from such common complaints as sore throat, head colds, and mouth breathing; it lessens the chances of having discharging ears and their complications; it assures some protection against glandular infection, but is no guarantee against it, and it does not assure the immediate disappearance of large cervical glands; it does not influence favourably or

unfavourably infections of the larynx, bronchi, and lungs, as they occur equally in the two groups; it does not prevent scarlet fever or measles, but may influence the severity of the infections; it seems to lessen the incidence of diphtheria by removing fertile soil for the diphtheria bacillus; it has not influenced the incidence of chorea or rheumatism; it has shown a lessened incidence of heart disease over a period of three years; and it has definitely reduced malnutrition in the group operated on, as compared with the group that was not operated on.

N. P. Stauffer² deals with the similar question as to the results of removing septic tonsils in adults for focal infections, particularly arthritis. As a result of an experience with 300 cases, he concludes that in the early stages of the arthritis, septic tonsils are frequently present, and their removal produces very great improvement in the joint lesions. In the later stages of a chronic arthritis, however, the removal comes too late and is seldom worth while. In addition, the shock of the operation in these hopelessly crippled cases may be the straw which breaks the camel's back.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, July 5, 33; ²*Laryngoscope*, 1925, Feb., 165.

TUBERCULOSIS AND ITS PREVENTION.

Joseph Priestley, B.A., M.D., D.P.H.

The battle against tuberculosis still continues, and the year 1925 will be memorable as the year when the Ministry of Health introduced the following important Regulations;—

1. *Public Health (Tuberculosis) Regulations, 1924.*—These Regulations came into force on Jan. 1, 1925, and are to be read as one with the Regulations of 1912 and the Public Health (Tuberculosis) Regulations, 1921. Under these Regulations, a quarterly return or statement must be furnished by every medical officer of health to the medical officer of health of the administrative county within which his district is situated—such return or statement to be compiled from the register of notifications of tuberculosis, and to show: (a) The number of cases of tuberculosis on the register at the commencement of each quarter; (b) The number of cases notified under the 1912 Regulations for the first time during each quarter; (c) The number of cases removed from the register during each quarter (giving the name and address of each such case and the reason for such removal); and (d) The number of cases remaining on the register at the end of each quarter. Separate figures are to be given in each case for males and females, and for pulmonary and non-pulmonary cases, and under the term 'pulmonary' it is desirable to include all tuberculosis of the respiratory system, e.g., tuberculous pleurisy, and tuberculosis of the larynx, nose, throat, bronchial glands, and mediastinal glands. The 'quarters' for these returns are the usual quarters ending March 31, June 30, Sept. 30, and Dec. 31, as the case may be.

2. *The Public Health (Prevention of Tuberculosis) Regulations, 1925.*—Under these Regulations, a much-wanted power has been given to sanitary authorities for dealing with active pulmonary consumption or tuberculosis of the respiratory tract in the case of persons engaged in handling or dealing with milk under such conditions as to create a danger of infection of the milk. Hitherto, sanitary authorities have had to depend upon persuasion; but now, by Article 5 of the Public Health (Prevention of Tuberculosis) Regulations, 1925, special statutory powers are given. The report of the medical officer to the sanitary authority must be in writing, stating that a person residing in the district who is engaged in any employment or occupation in connection with a dairy, which would involve the milking of cows, the treatment of milk,

or the handling of vessels used for containing milk, is suffering from active tuberculosis of the respiratory tract and is in an infectious state. On the receipt of such report, the sanitary authority may require such person to discontinue his (or her) employment or occupation on or before a date specified in a notice (not less than seven days after the service of the notice), such notice to be in writing and signed by the clerk or the medical officer of health. There is an appeal by the person aggrieved to a court of summary jurisdiction, and there is power given to grant compensation for damages. It will be noticed that the Regulations are limited to milk and to tuberculosis (in an active stage) of the respiratory tract. It is probable, and it is to be hoped, that the same powers will be extended to other foods than milk.

Tuberculosis and the Milk Supply.—The question of bovine v. human tubercle bacilli comes up again and again, and it is apt to be forgotten where, exactly, experts are. It is now many years since Professor Koch's statement that the bovine and human forms of tuberculosis were not interchangeable was disproved by a Royal Commission's report, wherein it was shown that, in human gland tuberculosis, the bovine tubercle bacillus was found in 85 per cent of cases under 5 years of age, and in 18.2 per cent of adults; in bone and joint tuberculosis, 30.2 and 5.9 per cent respectively; in scrofuloderma, 58.3 and 7.7 per cent; and in lupus, 66 and 17.6 per cent. Further, the bovine bacillus was found to be the *causa causans* in 66.6 per cent of meningitis cases, being found in the cerebrospinal fluid during life. In other words, about 80 per cent of tuberculosis infection that had entered by the alimentary tract were due to the bovine bacillus. The bovine form cannot be converted into the human, and vice versa. These facts cannot be too widely known. The lesson to be learnt is obvious—attack the milk supply. But how? The Tuberculosis Order should be reintroduced with a view to stamping out the disease in milch cows. Whatever the expense might be, it would be more than met by the subsequent and consequent saving in expenditure connected with sanatorium treatment, open-air treatment, and centres for surgical bovine tuberculous patients. 'Certified' or 'grade A' (tuberculin-tested) milks should come into general and sole use, and this, it is stated, can be effected by a charge of an additional 1d. per quart to the present retail price. Unfortunately, this additional expense will act as a block to an ideal and tuberculosis-free milk supply, and every effort should be made, therefore, to secure the next best thing, viz., pasteurization—efficient and scientific pasteurization—despite the alleged scurvy dangers of such a diet, which are only alleged dangers and have not yet been proved.

A somewhat new view of the question of tuberculosis-infected milch cows is that which has recently been brought forward: bad feeding and over-work to which milch cows are subjected. The first (bad feeding) is the absence of vitamins, the vitamin content being absent from the diet of dairy cows owing to the whole of the grain germ therein being removed. As to the second (over-work), this will be admitted when it is remembered that a cow is now called upon to yield from one to two thousand gallons of milk per annum in place of what Nature intended, viz., sufficient milk to feed one calf, and that, too, when natural vitamin-rich foods are abundant. Such a drain upon the fat and protein of a milch cow must lead to low resistance power or immunity against the *Bacillus tuberculosis*.

Recent experiments on pigs (hygienically housed and maintained) with an ordinary pig's diet supplemented by added vitamins have shown that it is the absence of vitamins, and not insanitary conditions of sty or pen, that causes or leads to tuberculosis infection. Isolation and disinfection were proved in these experiments to be unnecessary for the eradication of the tubercle infection.

The rarity of tuberculosis in sheep, horses, and bullocks is explained by the more natural life to which such animals are subjected, when compared with the milch cows. Pigs on a vitamin-rich diet passed one-third less protein in their stools. Animal protein is necessary in pigs' diet, as, with vegetable protein, there is a 25 per cent conversion loss. The result of the pig experiments goes to show that what is really needed is to increase the natural immunity of animals by providing a diet rich in carbohydrate, protein, mineral salts, and vitamins; and that sunlight, cleanliness, segregation, and disinfection, though good measures, would not in themselves eradicate the disease. Further, that slaughter of all tuberculous cows in the country would only give immunity for two years, as reinfections or fresh infections would arise from the tubercle-infected cowsheds.

There can be no two opinions as to the necessity for slaughtering all milk-animals (about 2 per cent of the whole) showing gross udder disease or advanced tuberculosis. To suggest the slaughtering of all reactors simply as such is quite another matter. There is such a thing as the mutability of the *Bacillus tuberculosis*, and the immunizing effect of small doses of tubercle-infected milk. The importance of the subject is realized by the fact that about 10,000 children die yearly through bovine tubercle infection. There is, however, no legal compulsion to have dairy cows regularly tuberculin-tested or even regularly inspected by a veterinary surgeon. There is no legal compulsory slaughtering of tubercle-infected cows demanded, nor even their legal compulsory isolation. On the contrary, *suspected* tuberculous cows may be sent to the markets in the ordinary way, and sold for use for human food. Such is the present state of the law, and it certainly seems incredible in the year 1925! The Milk and Dairies (Consolidation) Act, 1915, came into force (in parts) in September, 1925!

TUBERCULOSIS, PULMONARY. (See also LARYNX, DISEASES OF; PHARMACOLOGY—COCAINE IN EUTHANASIA.) W. H. Wynn, M.D., F.R.C.P.

BACTERIOLOGY.

There has for long been a discussion as to whether tubercle bacilli are derived from acid-fast saprophytes which have become parasitic in warm-blooded animals, or, vice versa, that acid-fast saprophytes are transformed tubercle bacilli. A. Calmette,¹ in discussing this question, states that no experiment shows that paratubercle can be transformed into true tubercle bacilli, or that true tubercle bacilli can be modified into paratubercle bacilli. Paratubercle bacilli cannot be used to produce active immunity against active tuberculosis. Bovine, human, and avian tubercle bacilli form a group of definite specific organisms. Paratubercle bacilli therefore play no part in the spread of tuberculosis. L. Nègre² also agrees that there is no experimental evidence that the tubercle bacilli of warm-blooded animals can be transmuted into the acid-fast bacilli of cold-blooded animals or into saprophytic bacilli, and conversely. Paratubercle bacilli have undeniable biochemical relations with tubercle bacilli, and may to a slight extent act as antigens in the complement-deviation reaction. F. Neufeld,³ in a paper mainly concerned with criticizing the contention of the Leipzig school that it is possible to convert the human into the bovine type of bacillus, discusses the great differences in the relative frequency with which the bovine bacillus has been found in man in different countries. In Berlin, Rothe and Bierotte found the bovine type only in 5 out of 38 cases. In Copenhagen, Andersen found only 4 in 23 cases of lupus. Mollers found it only in 3 out of 951 cases of pulmonary tuberculosis. Fraser, in Edinburgh, on the other hand, found the bovine type in 41 out of 70 cases of tuberculosis of bones

and joints. Neufeld's explanation is that in dense populations children are infected with bovine bacilli, but this does not result in active infection, as the children have already been infected with human bacilli. Even when bovine bacilli have entered first, subsequent repeated infection with human bacilli will prevent the primary bovine lesion from developing. In country districts with lessened exposure to human infection, the incidence of bovine infection will be high, as it has not to compete with the other type. G. R. Ross⁴ points out that Brownlee's three clear-cut statistical types of phthisis—the 'young adult', 'middle age', and 'old age'—with the suggestion that there may be two distinct strains of tubercle bacilli each having a special age distribution, throw out a challenge to bacteriological research. Ross, with Tulloch, Munro, and Cumming⁵ have attempted to demonstrate 'groups' by the investigation of 100 strains of bacilli from cases of phthisis. The strains, with two possible exceptions, were all of the human type. The strains were tested by agglutination and absorption of agglutinin test, and it was found that all the bacilli conformed to one well-defined serological type.

ETIOLOGY.

On the vexed question of hereditary predisposition, Raymond Pearl⁶ contributes an important paper. He is engaged on a large-scale investigation, not yet complete, and carefully abstains from positive statements. He has studied 57 persons—38 tuberculous, 19 non-tuberculous—the family histories of whom, covering 5000 blood relatives, had been traced. He tabulated the proportions of the relatives in each generation who were or were not tuberculous. The parental generation of the non-tuberculous subjects included 763 persons, of whom 14 (1.8 per cent) were tuberculous; the parental generation of the tuberculous subjects included 472 persons, of whom 42 (8.9 per cent) were tuberculous. Taking all generations together, 7 per cent of the blood relations of the tuberculous and 1.2 per cent of the blood relations of the non-tuberculous were themselves affected. He finds that, as the amount of tuberculosis in the direct ancestry increases, the amount of tuberculosis in the offspring increases also, but the disturbing fact is that the rate of close contact with open cases increases enormously more rapidly than does the rate of incidence. In short, where one or both parents are actively tuberculous, practically all the offspring who subsequently develop tuberculosis have been in close intimate contact with another active case, usually, of course, that of the parent or parents. Those who oppose the view that constitution plays any part in the etiology will assert that this explains the whole matter—that if the children had not been in contact with the open active cases they would not have broken down. Just possibly this may be right. But the case is not so simple, for the figures show that where one or both of the parents were actually tuberculous, virtually three-fourths of the non-tuberculous offspring had been in just as close contact with active open cases as their brothers and sisters who developed the disease.

S. Rowland⁷ deals historically with the other vexed question of conjugal tuberculosis. He gives the statistics of many authors, and shows that the percentages of infection among consorts of the phthisical vary from 1.5 to 58 per cent. Rowland finds the reason for this great variation to be that most observers have dealt only with infection—a very doubtful quantity, varying with the personal equation of the observer. He himself gives only figures relating to the deaths, and finds that, in a ten-year period, of 525 married persons who had died there were only 14 instances where both partners had died of phthisis. This gives a rate of 2.7 per cent. He therefore concludes that conjugal tuberculosis is rare, and that the death-rate from phthisis of the partners of tuberculous persons differs little from that of the general population.

PROPHYLAXIS.

A. Calmette has long urged that the control of tuberculosis depends on preventing the dissemination of the bacilli by treating every tuberculous man or animal, however slightly affected, as a potential source of danger, and on being able to protect artificially the susceptible individuals by some method of vaccination. To the possibility of protective vaccination he has long applied himself. In 1924, with C. Guérin,⁸ he reported a series of observations on calves in which encouraging results were obtained. The animals received when quite young a large dose—50 to 100 mgrm.—of a non-virulent live culture subcutaneously, and subsequently at intervals of from 1 to 18 months resisted an intravenous dose of virulent organisms to which the controls all succumbed. The vaccinating strain was originally a very virulent bovine culture, which since 1908 has been continuously grown on potato cooked in ox-bile with 5 per cent glycerin. After thirteen years and some 230 subcultures, this strain was found to have lost virulence for all species of animals, but to be antigenic in the sense that inoculation excites the formation of antibodies demonstrable by complement-fixation. Since the year 1922⁹ vaccination with B.C.G. (Bilie-Calmette-Guérin) has been applied to a number of infants after demonstrating that by whatever method it was introduced there was no danger of infection to others, or harm to the vaccinated individual. The technique used was to give three doses of 1 cgrm. of the living culture weighed in the fresh state and emulsified in 2 c.c. of the following liquid: glycerin 40 grm., glucose 10 grm., distilled water 1000 grm. These doses, prepared not more than ten days before, were swallowed in a little milk half an hour before a feed on the 4th, 6th, and 8th days, or the 5th, 7th, and 9th days, after birth. In June, 1922, 178 nurslings were vaccinated and kept under subsequent observation. Up to June, 1923, 15 had died, and in no instance was death from tuberculosis. This death-rate of 8.4 compares with one of 11.6 per cent for infants of the same age in the whole of France in 1921. Since July, 1924, 1070 new-born infants have been vaccinated in France and Belgium. Precise information in July, 1925, was obtainable of 423 who had been vaccinated for six months or longer; 137 had been exposed to tuberculous infection in the family, of which 86 had a tuberculous mother. The deaths numbered 30 (7 per cent), and there was no death from tuberculosis. As a control, 1362 tuberculous mothers, who in 1922 had 1364 children, were taken. Of these children, 327 (24 per cent) died before July, 1925. Statistics were also obtained from various dispensaries. In short, an infant born of a tuberculous mother and not separated from the mother has one chance in four, or in certain places, e.g., Paris, three chances in four, of dying from tuberculosis in the course of the first year. Against this is placed no death from tuberculosis among 137 infants who lived more or less constantly exposed since birth to family infection.

HÆMOPTYSIS.

F. B. Trudeau¹⁰ discusses the significance of a hæmoptytic onset in phthisis. Of 2845 patients admitted to the Trudeau Sanatorium, 245, or 8 per cent, had hæmoptysis without a previous history suggesting tuberculosis. Taking four points—sputum examination, X-ray findings, râles, and pleurisy with effusion—as definite evidence of tuberculosis, in only 10 did he fail to find one or more of these present. During their stay in the sanatorium, 119, or 48.5 per cent, had a positive sputum, while tubercle bacilli had been found in 30 prior to entering the institution; 60.81 therefore had a positive sputum. In 69.8 per cent a confirmatory diagnosis was made by X rays. Râles were present in 80 per cent; 4 per cent had had at some time a pleurisy with

effusion. The condition of these 245 patients one to twelve years after leaving the sanatorium was 46·5 per cent well, 25·7 per cent living, 14 per cent dead, 8·5 per cent unknown. Trudeau concludes that the prognosis in this type of case is no better and no worse than with any other mode of onset. He considers that any person having an unaccountable hæmoptysis of a drachm or more should be carefully studied for other signs of tuberculosis, and should remain under close observation for several months. During the fourteen weeks of epidemic colds from January to April, 1923, J. Walsh¹¹ saw 204 tuberculosis patients. Of these, 51 had a cold, 46 in the form of acute bronchitis and 5 an acute coryza. Of the 46 with bronchitis, 17 spat blood, and 8 later had an exacerbation of the tuberculosis. Of the 5 with coryza, 4 had blood in the nasal discharge. During the seven weeks previous to Jan. 1 and the seven weeks succeeding April 7, Walsh saw 220 tuberculous patients. Of these, 13 spat blood, or only one-third the number as during the colds epidemic.

M. Ardizzone¹² has employed Autohæmotherapy in about 100 cases of hæmoptysis. At first he kept 1 c.c. of 4 per cent sodium citrate solution in the syringe to prevent coagulation, but later he omitted this and carried out the operation quickly before the blood clotted; 5 to 8 c.c. of blood were drawn from a vein at the elbow and injected at once into the gluteal muscles. No bad effects were seen, but the hæmorrhage, however profuse, usually ceased within an hour. Good results were obtained in protracted hæmoptysis which had been treated unsuccessfully in other ways. Smaller doses—2 to 3 c.c.—were less successful. No effect was obtained, of course, when the hæmorrhage was due to rupture of large aneurysms in cavities.

LARYNGEAL TUBERCULOSIS.

Heaf,¹³ in a series of 133 autopsies on pulmonary tuberculosis, found abnormal features in the *trachea* in 44 per cent. The lesion varied from a slight œdema of the mucous membrane to a general ulceration of the whole surface. The mucous membrane became deeply congested and œdematous; small superficial ulcers formed and coalesced into a large irregular shallow ulcer. The lesion is usually just proximal to the bifurcation. In only 2 out of the 58 cases was there also laryngeal disease. In 81 cases with laryngeal ulceration the trachea escaped 25 times. All the patients had complained of a loud distressing cough, paroxysmal and refractory to treatment. There was deep-seated retrosternal pain, and a raw aching across the chest after coughing. All had dyspnœa and a feeling of tightness of the chest. Treatment was difficult and only palliative, but some relief was obtained by frequent insufflations of Pulv. Anæsthesin and Orthoform in equal parts, administered through a Leduc's tube.

TUBERCULOSIS OF THE TONGUE.

II. Morrow and H. E. Miller¹⁴ have seen 16 cases since 1915, in which year Durante was able to compile 250 cases. Their incidence of 1 per cent is much higher than ever previously reported. In 4 cases the first sign of tuberculosis was in the tongue, but three showed pulmonary disease on examination; in the fourth no signs were found in other organs. The tubercle bacillus may gain entrance by direct inoculation from outside, inoculation from sputum, from the blood- or lymph-stream, or spreading from adjacent tissues as in lupus. Clinically all cases fall into one of three groups: (1) nodular, (2) ulcerative, (3) papillomatous. Small scattered nodules may occur in miliary tuberculosis. A solitary and superficial nodule may be caused by primary inoculation, while the multiple and deep lesions are secondary. Most of the ulcers begin as superficial nodules which break

down and become painful. The ulcer is much the most common lesion; 14 of the 16 cases showed ulceration. The papillomatous lesion is very rare. The projections resemble hypertrophic circumvallate papillae. The lesions may occur anywhere on the tongue, but more often on the superior surface and the tip and lateral borders. Differential diagnosis in the absence of pulmonary lesions and microscopic examination of tissue is difficult. A primary syphilitic sore is more indurated, and the infiltration extends beyond the ulcer. Spirochaetes can be found. A gumma generally occurs on the posterior part of the tongue, and when ulcerated is deeper and the edges are sharper. The Wassermann test is positive in 80 per cent. A carcinoma is more indurated, almost always solitary, and often can be diagnosed only by microscopic examination. In traumatic cases there is usually an obvious source of trauma, and when this is removed the ulcer heals rapidly. If a piece of tissue is to be removed for examination the entire lesion must be taken. A tuberculous lesion that has been cut into breaks down rapidly and becomes more extensive. The surgical removal of a V-shaped area gives the best result in treatment. The cautery may be valuable in extensive ulceration; curetting generally makes it worse. Antiseptic applications are of little value. (*Plate LVII.*)

TREATMENT.

Chemotherapy.—W. E. Dixon¹⁵ critically discusses the specific action of drugs in tuberculosis. The action of the ordinary antiseptics such as **Phenol**, **Cresol**, **Guaiaacol**, **Mercury Perchloride**, and **Formalin** is greatly diminished by admixture with serum, and when injected into the animal body they destroy the animal before they destroy the parasites. By brominating cresol a tetrabromocresol is obtained which is 250 times more active than phenol and only half as toxic, and by brominating naphthol tribromonaphthol is formed which prevents the growth of staphylococci in dilutions of 1–250,000. But as internal antiseptics they are useless, as they affect the body tissues before parasites, and much of their antiseptic action is destroyed by tissue proteins. If these coal-tar derivatives exert a beneficial action on tuberculous patients, the explanation is not that they influence directly the tubercle bacillus. The same is true of formic aldehyde, which in the body at once combines with proteins and loses all antiseptic action. Essential oils have been the basis of many 'cures', but all have failed. Many have written of the beneficent action of calcium; thus Maendl treated 250 patients with intravenous injections of 5 c.c. 10 per cent calcium chloride every day or second day. The injections were given in alternate weeks, and each patient received twenty injections. Symptoms were influenced favourably. Calcium injections may limit inflammatory exudation, but they do not influence the cause of the condition. **Silica** is a more recent specific. Maver and Wells found no increase in the duration of life or alteration in the tuberculous process in their experiments on guinea-pigs. Compounds of arsenic and mercury have been used, and De Witt described certain mercury compounds which caused fibrosis and healing of tubercles in slowly progressive chronic tuberculosis of experimental origin. Careful experiments with likely organic arsenic derivatives show no action on the pathogenicity of the tubercle bacillus and no favourable influence on the disease. The chemotherapeutic substances such as optoquin, rivanol, and flavine, which have a selective action on certain bacteria, are without value in tuberculosis. The destruction of the tubercle bacillus is difficult owing to the fatty protective envelope and the small blood-supply to tuberculous lesions. Success, however, has been claimed for several metallic compounds, particularly of **Cerium**, **Copper**, and **Gold**. Frouin found that guinea-pigs inoculated with tuberculosis and treated with injections of

PLATE LVII.

TUBERCULOSIS OF THE TONGUE



Fig. A.—Tuberculous ulcer on the lateral border of the tongue, in a patient without any other signs or symptoms of tuberculosis.



Fig. B.—Punched-out tuberculous ulcer on the inferior surface of the tongue, in a patient with advanced pulmonary tuberculosis.

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cerium sulphate survived from two to five months longer than untreated controls, and examination showed considerable growth of fibrous tissue in the tuberculous lesions. Grenet and Drouin used cerium earths in chronic tuberculosis of patients, and claim that the metal reduces the fats of the tubercle bacillus in cultures, and that it produces a mononuclear leucocytosis. If cerium exerts any influence it cannot be by direct action on the bacilli, as its inhibitory action is very weak. The evidence of any improvement in human patients is so far of little significance. Copper salts have had a great boom in the past, but extended investigations on animals made with various compounds show that the treatment is valueless. Copper salts have a strong action on putrefactive bacilli such as *Proteus vulgaris*, and Dixon suggests their use in gastro-intestinal putrefaction. Koch showed that potassium gold cyanide (1-1,000,000) prevented the growth of tubercle in cultures, but the presence of blood serum greatly weakened the action. Feldt introduced 'Krysolgan', or amido-aurophenol carbonic acid. This, in 1-100,000 strength, prevents the growth of tubercle bacilli, but animal experiments were not promising, although some hopeful clinical results were published.

Sanocrysin.—More recently Moellgaard¹⁶ has introduced sanocrysin, which is a double thiosulphate of gold and sodium, $\text{Au}(\text{S}_2\text{O}_3)_2\text{Na}_2$. This retards growth of tubercle bacilli in glycerinated bouillon in strengths of 1-1,000,000. Moellgaard assumes that his gold injections destroy the tubercle bacillus *in vivo*, and states that doses which are not poisonous in themselves kill the tuberculous animal by producing a tuberculin shock. This shock begins with albuminuria and sometimes hæmaturia; it is followed by toxic myocarditis and pulmonary œdema. Non-tuberculous animals do not show this shock. To combat it, Moellgaard recommends a previous injection of antitoxic serum, after which his gold cure may be injected with impunity. Sanocrysin is a solid, snow-white substance, composed of long needle-like crystals. It is freely soluble in water, 1 grm. being dissolved by 2 c.c. of water, and the solution is almost neutral. It diffuses rapidly through animal membrane. It is not decomposed when in dilute aqueous solution by temperatures up to 130° C. It does not precipitate proteins. A solution of 1-100,000 kills the tubercle bacillus, and 1-1,000,000 prevents growth. It also alters the staining properties of the bacillus, which loses its acid-fastness. Doses of 1 to 4 cgrm. per kilo. body weight produce no symptoms in healthy animals, except that slight albuminuria may occur with doses of 2 cgrm. Injection of sanocrysin into tuberculous man or animal may present any of the following symptoms: albuminuria (which can be cured by the administration of serum), rise of temperature, exanthemata, loss of weight, intestinal disturbances, focal reaction. Experiments showed that injections of sanocrysin could be made safe if serum was given as soon as albuminuria commenced, but even then a series of symptoms were usually produced which could not be entirely counteracted by the serum. The serum used was prepared by injecting calves with tubercle bacilli killed by heat, and with tuberculin—more recently the serum of horses injected with diaplyte vaccine has given better results.

Moellgaard has supplied the Medical Research Council with the salt and the serum, and they have been used by several observers, who have issued a preliminary report.¹⁷ Each dose of sanocrysin was dissolved in 10 c.c. of distilled water and injected intravenously. The usual amount was 0.5 grm. for the first injection and then repeated injections of 1 grm. each at intervals of about three days, unless a severe reaction on the part of the patient occurred and compelled delay. The total amount used was generally about 5 or 6 grm., and the injections were rarely continued until the goal suggested by the Danish experiences was attained—a final state in which the last injection produced

no rise of temperature. The specific serum was injected into the muscles in doses of 20 c.c. In cases with heavy tuberculous infection the serum was used either before or together with the first gold injection as a preliminary measure. In mild cases it was not used until a reaction of some severity had occurred, and in many instances it was not used at all. Vomiting was often noticed as an immediate effect within a few minutes of injection. In a group of five clinically mild cases there were slight pyrexia and trifling albuminuria, but no other reaction. The gold salts up to 5 or 6 grm. seemed to be non-toxic for patients with only slight lesions. Severe reactions were generally produced in cases of more extensive infection. The temperature rose in a few hours to 103° to 104° ; vomiting often recurred, but diarrhoea was not frequent. The patient felt ill and depressed. A metallic taste was sometimes complained of, and there was a tendency to ulceration of the mouth and throat. The rise of temperature lasted three or four days, but was generally less with successive doses. After the second or third dose, rashes, like measles or scarlet fever, often appeared. Albuminuria was common but did not last long, and there was no œdema. In one necropsy, where there had only been trifling albuminuria, 8 per cent of the total metallic gold injected was found in the kidneys on death twenty-eight days after the last injection; and jaundice of a grave nature occurred in another patient who died, and a large amount of gold was found in the liver. In the lungs a focal reaction was shown by local pain, a sense of tightness, and prolonged tachypnoea. A local increase in crepitant râles, and increase of cough and sputum, were also noted. At some hospitals nearly every patient had severe serum sickness, but other observers did not find this. It was difficult to form a clear conclusion as to the benefit of the serum.

Clinical experience in England has confirmed the description of the immediate effects of sanocrysin. The drug does appear to have a specific action upon tissues infected by the tubercle bacillus, and the severity of the constitutional reactions appears to be related to the intensity of the tuberculous infection. The total number of cases was small, about 30, of whom 22 definitely had pulmonary tuberculosis. Two of the pulmonary cases died, death in one hopeless case being perhaps accelerated by the treatment, and occurring in the other unexpectedly from toxic jaundice. It was the opinion of those who had had most experience in dealing with consumption that the early cases of open tuberculosis did show some evident improvement, though there was no dramatic benefit. On the other hand, cases with more advanced disease did not stand the treatment well, and the condition of some was made worse.

J. Gravesen¹⁸ discusses the indications for sanocrysin treatment. He adopts a very varying method of administration. In the most difficult cases he uses much smaller doses than originally recommended, and in a few cases the initial dose has been as low as 12.5 cgrm., the dose being very gradually increased to accustom the patient to the neutralization of the increased amount of toxins. Further dosage is arranged according to the tolerance found on previous injections, the doses being increased by 25, 50, or 100 per cent, and the intervals varying from two to six or more days according to the reaction. The maximum dose was about 2 cgrm. per kilo. (i.e., 100 to 150 cgrm.). Treatment might extend to several months. He considers that some of the complications, e.g., colitis and stomatitis and some cases of dermatitis, were due to metallic poisoning. Out of 44 patients, positive results were obtained in 22; of these, 3 were apparently cured, 7 much improved, and 12 improved; 22 were either stationary or worse, and 11 have since died. Some of those who died were apparently so influenced by the treatment as to have died earlier than was expected. Gravesen is convinced that in sanocrysin we have a real chemospecific, with an action, hitherto unknown in tuberculosis, upon certain suitably selected

cases, and that on account of its specificity its clinical utilization necessitates a careful administration and great selective discrimination until points at present obscure can be brought to light.

De Witt, Cadwell, and Leavell¹⁹ in 1918 studied the effects upon tuberculous animals of gold administered orally, intravenously, and subcutaneously, and they found that there was more gold in tuberculous tissues; and De Witt and Sherman showed that the stimulation of growth of tubercle bacilli by solutions of gold too dilute to kill or to inhibit is an important consideration in treatment, since it is difficult to keep the concentrate of gold in the animal body at or above the point required for inhibition. De Witt more recently writes that from all experiments we may conclude that the use of gold salts is not without danger. When active, the actions seem associated with marked hyperæmia and possible hæmorrhage in the neighbourhood of the tubercles.

O. Bang²⁰ severely criticizes the claim that sanocrysin has a bactericidal action. He describes a test indicating that sanocrysin in a 1 per cent solution at 38° C. fails to kill tubercle bacilli in eleven days, and in his experiments on animals he failed to find any benefit from gold treatment. He concludes that the gold salts investigated have no specific action upon tubercle bacilli, and that any curative result found in human tuberculosis must depend on other factors.

The present position as regards sanocrysin appears to be that its specific action upon tuberculous tissues must be accepted, but it is doubtful whether the symptoms resembling tuberculin shock produced by its injection are due to a bactericidal action with liberation of endotoxin, or whether, for instance, they can be explained by damage to tissues and the washing out of bacteria and toxins. At present the method seems an indirect one of giving tuberculin, but less safe than giving tuberculin in carefully graduated doses directly. Prolonged clinical investigation is required before an estimate can be made of the value of sanocrysin, and, if the method acts by setting free tuberculin, the dose must be much more carefully graduated according to the class of case than has hitherto been done.

Sodium Morrhuate.—J. Hume²¹ publishes a favourable report of its use in 11 cases. He begins with a dose of 0.5 c.c., and if the reaction is only very slight proceeds to a dose of 1 c.c. administered twice a week. G. Jessel²² gives subcutaneous injections of a 3 per cent sterilized solution twice a week, and towards the end of the course once a week. The dosage was 0.1 c.c. gradually increasing to 0.9 c.c. Injections were given to 17 chronic or advanced males, the remaining 27 patients in the hospital being regarded as controls, while one patient received similar injections of distilled water. A local reaction—slight to moderate redness with occasionally some local superficial necrosis—was often seen. Injections were not given to patients with marked fever, and if during treatment the temperature rose to 100° the injections were stopped until the fever subsided. The number of injections varied from 5 to 13, but three patients received less than 5. In 7 injections were stopped because of fever, 3 declined further treatment, and 2 were discharged. Two patients, one of whom received 11 and the other 12 injections, were discharged improved, but during the same time other men who had not received the injections were discharged improved. He concludes that there is no evidence that sodium morrhuate in the doses used has any material effect upon tuberculosis in its chronic or advanced stages.

Heliotherapy.—I. D. Bronfin²³ studied 50 sanatorium cases with an average period of one year under heliotherapy; 40 had advanced active disease, and 32 suffered from extrapulmonary complications. General and local improvement was found in 18. One year after treatment had stopped, 13 were more

or less unchanged, 2 had relapses, and 3 were dead; 14 experienced temporary general improvement, and of these, 5 acquired full working capacity. Only 10 became progressive. No definite effect was noted on the cough, expectoration, or the presence of bacilli in the sputum. In 50 per cent low-grade fever occurred, and in some it persisted for six months after treatment had stopped. An acceleration of the pulse by 20 to 30 beats was noted in 30 per cent; 20 per cent gained weight, but 54 per cent lost on an average 10 lb. each. The only definite blood change was an increase of lymphocytes in 60 per cent. The proportion of improved cases was much greater in the 30 per cent with marked pigmentation than in the others. Extrapulmonary complications were invariably influenced favourably. Pleural exudates were rapidly absorbed. Five developed fatal complications during the heliotherapy. Rollier's method of careful and progressive exposure of the different parts of the body, beginning with the lower extremities, was closely followed. Not more than a total of three hours' exposure was permitted daily. Bronfin concludes that heliotherapy has not yielded encouraging results in advanced phthisis. The favourable results sometimes seen cannot be attributed to heliotherapy.

H. Lo Grasso and F. C. Balderrey²⁴ regard heliotherapy as of the greatest value in pulmonary tuberculosis, one of the most marked benefits being the striking improvement in the general physical condition. The blood picture is improved, as shown by an increase in hæmoglobin, an increase in lymphocytes, and a diminution of polymorphonuclear cells. The activity of the lesion is reduced, as shown by subsidence of fever, reduction in pulse-rate, decrease in sweating, and lessened expectoration. It greatly favours absorption of exudates, as in pleurisy with effusion and pyopneumothorax. According to their experience, heliotherapy will not provoke hæmoptysis or increase the activity of the lesion if judiciously used. Moderate rises of temperature, if not due to acute complications, do not preclude its use; but very active disease, marked toxæmia, and the acute miliary form of the disease are contra-indications. These observations are based on a large number of cases.

Sanatorium Treatment.—Noel Bardswell²⁵ discusses the results of sanatorium treatment. There were three important independent studies of mortality among sanatorium patients which gave results of striking similarity. These studies covered 3000 cases at the Adirondack Sanatorium from 1885 to 1911; 1700 cases at King Edward VII Sanatorium, Midhurst, from 1907 to 1914; and 3738 cases at Brompton Hospital Sanatorium from 1905 to 1914. These figures showed that in early cases the mortality was six times that of the general population; in moderately advanced 16 times heavier, and in advanced cases 36 times heavier. An analysis of some 10,000 cases treated by the public health authorities in London indicates that of the early cases some 75 per cent will be found alive five or six years after leaving a sanatorium; of moderately advanced cases 50 per cent will be alive. Patients who survived the first five years had appreciably better prospects. Sanatoriums which treat patients of the more well-to-do classes show better ultimate results. In all statistics a great difference is noted between the chances of survival in cases in which bacilli were found and those in which they were not found. Of sputum-negative cases, after-history returns show permanent recovery in 80 per cent or more.

F. H. Heise and L. Brown²⁶ give the results of treatment of 5915 patients traced out of 6234 treated in the Trudeau Sanatorium from 1885 to 1922. On admission, these patients were classified as follows: minimal, 1512, 26 per cent; moderately advanced, 3453, 59 per cent; far advanced, 513, 9 per cent; suspected and non-tuberculous, 437, 7 per cent. Of these cases, there were

living, after from one to thirty-nine years, 1167 minimal (77 per cent); 1898 moderately advanced (55 per cent); 153 far advanced (30 per cent); and 403 suspected or non-tuberculous (92 per cent). The ages of the patients ranged from 11 to 62 years, with an average of 27.2. Of 1512 minimal cases, 52 (3.4 per cent) died of tuberculosis within two years; 95 (6.3 per cent) within four years, and 122 (8.1 per cent) within six years. Of 3453 moderately advanced cases, 548 (16 per cent) died of tuberculosis within two years; 784 (23 per cent) within four years, and 905 (26 per cent) within six years. Of 513 far advanced cases, 218 (42 per cent) died of tuberculosis within two years; 245 (48 per cent) within four years, and 260 (51 per cent) within six years.

Horton-Smith Hartley, R. C. Wingfield, and J. H. R. Thompson²⁷ give the results of patients treated in Frimley Sanatorium from 1905 to 1914. There were 2393 men and 1007 women, of whom 10 per cent could not be traced. Of the 2393 men, 1207 had died, 209 were lost sight of, and 977 were living, in 1918. Of the 1007 women, 378 had died, 134 were lost sight of, and 495 were living. In Group I patients, 79.3 per cent of the males and 89.7 per cent of the females survive five years; after ten years the corresponding numbers were 65.5 and 85.2 per cent. More than half the patients belong to Group II (moderately advanced); among these the percentages of survivors after five years is 56.1 among males and 67.4 among females, and at the end of ten years 38.2 males and 49.7 females.

Artificial Pneumothorax.—R. C. Matson, R. W. Matson, and M. Bisailon²⁸ discuss the results of artificial pneumothorax in an excellent article which deserves a lengthy abstract. They point out that several recent large statistics dealing with the end-results of artificial pneumothorax are very similar. In Rist's series of 570 cases of fibrocaseous tuberculosis the results were: 81 per cent clinically cured, 17.5 per cent improved, 17.5 per cent stationary, and 34 per cent unimproved and dead. Their own results in 423 cases of fibrocaseous and fibrocaseous-cavernous tuberculosis were: 32 per cent clinically cured, 20 per cent arrested, 16 per cent unimproved, and 32 per cent dead. Both series were of cases seen between 1911 and 1922. Saugman's statistics of 500 cases in fourteen years ending in 1921 show 40 per cent able to work. Brauer and Spengler report 31.8 per cent healing after fifteen years' observation; and Maendl, upon a basis of a questionnaire sent to 180 specialists totalling 1330 cases under treatment from two to twelve years, found permanent results in 66 per cent. When one takes into consideration that nearly all reports deal mostly with severe cases which have failed by other methods of treatment, one must admit that artificial pneumothorax has become not only an accepted method of treatment, but an obligatory one in certain cases. The end-results are much influenced by many factors: (1) Those concerned with the disease itself, such as its character, extent, activity, complications, and state of the other lung. (2) The character of the pneumothorax, whether an efficient collapse is obtained or not. (3) Complications which arise during treatment and intrinsic to it, and those independent of treatment. (4) Social and economic conditions. The authors' entire material comprises over 800 cases of artificial pneumothorax since January, 1911; but to illustrate its value they exclude all cases treated within the past two years, and all cases still under treatment; 492 cases remained. No case was classified as clinically well unless the sputum had been continuously negative, with an absence of all signs of activity, for two years. Cases in which the above conditions had existed for three months were classified as arrested. No case was subjected to pneumothorax until after a reasonable trial of sanatorium care, unless it justified the assumption that a cure would not be accomplished by such treatment. Of the 492 cases, 65 were moderately advanced and 347 were far advanced.

No incipient case was treated. They classify their cases into five clinico-pathological groups:—

Group 1.—This comprised 194 cases, *chronic and progressive, with little or no cavitation*. A satisfactory collapse was obtained in 99, and 53 per cent are clinically well, 15 per cent arrested, and 21 per cent dead (5 cases died of extraneous causes not related to tuberculosis). In 62 there was only a partial collapse. Of these, 17 per cent are clinically well, 19 per cent arrested, and 46 per cent dead. In 33 cases no free pleural space was found, and of these 15 per cent are clinically well, 12 per cent arrested, and 54 per cent dead. Among the 161 cases in which collapse was obtained, 111 had tuberculosis in the other lung, and in 54 it was active. Progression of the disease in this lung occurred in 12, but only in 7 did it compel discontinuance of treatment. This group gave the largest proportion of satisfactory collapses and the best after-results.

Group 2.—*Chronic progressive cases with cavities*, all with far advanced disease. A satisfactory collapse was obtained in 71, and 40 per cent are clinically well, 32 per cent arrested, and 15 per cent dead. In 70 there was partial collapse, and 11 per cent are clinically well, 17 per cent arrested, and 48 per cent dead. In 36 no free space was found, and 5 per cent are well, 8 per cent arrested, and 61 per cent dead. There was tuberculosis in the opposite lung in 119 cases, active in 70. In 14 the disease progressed, and in 9 treatment was discontinued.

Group 3.—*Cases not progressive, but with enormous cavitation and marked fibrosis*. Of 52 cases, a satisfactory collapse was obtained in 21, and 43 per cent are well, 24 per cent arrested, and 28 per cent dead. A partial collapse was obtained in 22, and 13 per cent are well, 9 per cent arrested, and 63 per cent dead. No gas could be introduced in 9, and none is clinically well, 22 per cent are arrested, and 44 per cent dead. The results were somewhat better than in Group 2. The cases were chronic invalids who had had prolonged sanatorium and climatic treatment. All expectorated large quantities of bacilli-laden sputum, so from the point of prophylaxis it was a good achievement to have restored some to health.

Group 4.—This comprised 39 cases of *acute phthisis*. All had rapidly advancing disease, with extensive invasion and severe symptoms; 13 had a satisfactory collapse, and 46 per cent are clinically well, 7 per cent arrested, and 23 per cent dead; 17 had a partial collapse, and 6 per cent are well, none is arrested, and 76 per cent are dead; 9 had no free space, none is well or arrested, and 97 per cent are dead. The authors consider that caseation is not a contra-indication, but a partial collapse is of little value and a complete collapse is vital. Pneumothorax is of doubtful value in cases of progressive caseation with no tendency to softening and with grave toxæmia.

Group 5.—This comprised 30 cases with *cavitation in both lungs*. All were far advanced. Seven had satisfactory collapse, and 3 are well and 4 dead. Of 12 with partial collapse, 1 is well, 2 are arrested, and 7 dead. Of 11 with no free space, none is well, 2 are arrested, and 7 dead. Bilateral cavitation has been regarded as a contra-indication. In these cases treatment was withheld until activity in the contralateral lung had largely subsided, leaving mostly a stationary cavity, and then the collapse was very gradually brought about.

The influence of a good collapse is shown by the fact that, of the 211 with a satisfactory collapse, 48 per cent are clinically well, 20 per cent arrested, and 21 per cent dead; whereas of 183 with partial collapse, 13 per cent are clinically well, 13 per cent arrested, and 50 per cent dead. To put it in another way, of the 183 cases who are clinically well, 76 per cent had a satisfactory collapse,

18 per cent a partial collapse, and 5 per cent no free space. They consider that the importance of disease in the contralateral lung has been greatly exaggerated, because improvement in this lung is often coincident with and dependent upon improvement on the collapsed side. The danger of pneumothorax has also been exaggerated. Of the 394 cases under this treatment, less than 2 per cent died as a result of complications related to it, such as gas embolism, empyema, spontaneous pneumothorax, etc. Of the cases with satisfactory collapse, the most common causes of death were extraneous and not related to tuberculosis, such as intercurrent disease, accident, etc. (17 per cent). The next most common cause was tuberculous enteritis (11 per cent). The third most common was reactivation of disease following voluntary discontinuance of treatment. They conclude that it is conservative to estimate that artificial pneumothorax will restore to health 40 to 50 per cent of the cases of which, when treated by sanatorium methods alone, not over 7 per cent would recover. The danger of adhesions preventing a satisfactory collapse increases with the duration, extent, and character of the disease, so that pneumothorax treatment should be utilized earlier than is customary.

Burnand²⁹ in twelve years made 450 attempts at artificial pneumothorax. Leaving out cases of failure to obtain collapse and obvious failure within the first few weeks from too little collapse or active lesions in the other lung, there were 237 cases from 1911 to 1923 with satisfactory collapse. From 1911 to 1915 only very advanced cases with pyrexia or advanced cavities, or caseous cases of various kinds, were treated. Since 1915 apyretic cavernous cases have also been treated. Of the 237, 129 are alive, 25 untraceable, and 82 dead. In 61 the results are excellent; all signs of activity have gone, and the patients are able to work. In 41 of these the pneumothorax is maintained, while in 20 it has been left to itself. In 40 others there are still active signs, but they are able to work; the collapse is kept up in 7. Of the 20 'cured' cases who have ceased treatment, collapse was kept up 7 years in two, 6 years in two, 5 years in one, 3 years in four, and 2 years in four. Burnand considers 3 years to be the minimum duration of compression, and that this should be prolonged unless there be valid reasons for giving it up. He considers that it is worth while treating all unilateral forms of breaking down in which spontaneous improvement pointing to the possibility of a cure does not take place within the first three months of their coming under treatment.

R. Hervé,³⁰ whilst urging that artificial pneumothorax should be used in all cases where suppuration occurs, insists upon the importance of combining with it hygienic Dietetic Treatment and a well-ordered Rest Cure in a suitable climate. He asks, "Can we expect that by temporarily suspending the functions of a lung we may, at a stroke, radically suppress all traces of tuberculosis and restore the normal physiological functions to debilitated organs?"

Effusions of Artificial Pneumothorax.—Hudson³¹ classifies these under three headings: simple, serous, and purulent. (1) *Simple effusions* occur in at least 50 per cent of cases without fever or pain. They are often recognized by X rays only and cause no unpleasant symptoms. (2) *Serous effusions* are a frequent complication. They begin with pain and fever. In uncomplicated cases the fever generally lasts three or four weeks, falling gradually to normal, and the fluid may become reabsorbed. It should not be aspirated unless the quantity becomes very large and causes discomfort. Replacement with air should then be done to prevent re-expansion. Sometimes sweating for one hour three times a week with aspirin may cause the fluid to disappear. (3) *Purulent effusions* may be due to tubercle bacilli only, or tubercle bacilli with other organisms. The former are most often seen in cases with severe infection.

The fluid is at first serous, but becomes turbid, and finally thick pus. It is best not to aspirate too soon, but to wait until active symptoms have abated. The fluid should be drawn off in small quantities at a time at weekly intervals, and replaced with air. This procedure may have to be repeated many times. In the cases of mixed infection, aspiration and air replacement should also be performed, and Hudson has found it useful in some cases to replace by Oil of Gomenol (10 per cent), which seems to prevent reaccumulation of the pus. If the infection is not too virulent, the whole process may eventually settle down and not give rise to severe septic poisoning. In another group, however, there is acute massive infection of the pleura, with high fever, shivering, sweats, and rapid emaciation. In two such cases, after frequent aspiration and washing out, the cavity was drained after rib resection, and an attempt made later to close the cavity by a plastic operation, but both patients died.

Bernard and Baron³² classify the pleuritis in pneumothorax into (1) the fluid variety, (2) the adhesive variety, (3) intermediate forms, (4) exceptional and grave forms, e.g., with repeated and rapid formation of pus, pleuritis following a perforation of the lung, and those with a fluid containing many bacilli. He advises against premature intervention in the serous varieties; but frequent radioscopic examinations must be made, and refills properly spaced according to the indications. The fluid should only be removed when it causes inconvenience by its quantity. In the adhesive forms, refills become more and more difficult owing to the gradual closing of the cavity, and it is necessary to inject sufficiently often as much air as can be got in under slightly raised pressures, if necessary aspirating some of the fluid to obtain a space for the refill. When the fluid is rich in bacilli, great care is necessary to prevent infection of the needle track. A sterile trocar should be inserted into the needle to clear it of any pus before withdrawal. They find that serous effusions have often a favourable influence upon the collapse, and hinder the absorption of the gas, so that refills can be more widely spaced. Adhesive pleuritis are often troublesome and bring the pneumothorax treatment to a premature end; but by the contraction of the chest wall the lung is immobilized for a long period, and the effect of a pneumothorax so prolonged.

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TUBERCULOSIS, PULMONARY, IN CHILDHOOD.

Reginald Miller, M.D., F.R.C.P.

F. G. Chandler and T. W. Preston¹ have investigated the cases of proved pulmonary tuberculosis in children for twelve years at the City of London Chest Hospital. Nearly 300 cases had been definitely diagnosed as pulmonary tuberculosis during that time; but, accepting only those proved either by sputum or post-mortem examination, the number was reduced to 89 cases under 15 years of age. Of these, 81 had tubercle bacilli demonstrated in the sputum. The age-incidence in these 81 cases was instructive, 70 being 10 years old or more; the death-rate was approaching 40 per cent. The authors tend

to stress the importance of examining the feces for tubercle bacilli where no sputum can be obtained, and look upon this test, if positive, as conclusive of pulmonary tuberculosis. They regard these results as showing that pulmonary tuberculosis is not 'extremely rare' in children, and if due regard be paid to the age-incidence in their cases no one will wish to criticize this dictum.

REFERENCE.—¹*Brit. Jour. Child. Dis.* 1925, xxii, 1.

TUBERCULOSIS OF THE SKIN. (See SKIN.)

TUBERCULOSIS, SURGICAL.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Tuberculous Glands of the Neck.—(1) There are certain outstanding facts with regard to tuberculous glands of the neck. In the first place, after hospital experience of nearly twenty-five years, the reviewer believes that the condition has become much less frequent. [This is certainly true in Bristol.—ED.] This decline in the number of cases is probably due to the early recognition and treatment of the primary foci in the mouth, nose, tonsils, pharynx, etc., and also to better hygienic conditions. (2) In most cases the glandular infection is secondary to tuberculosis of the tonsils, or post-nasal adenoids, although some have a dental origin. (3) The disease is limited at first to the particular group of glands, and to the primary focus, and in this way differs, as Fraser points out, from other forms of tuberculosis. (4) Glands scattered widely over both sides of the neck are associated often with enlargement of the mediastinal glands and peritoneal glands, and are probably a blood-stream infection. In such cases operation is seldom indicated. (5) If a tuberculous gland is split open, the tubercles are found chiefly in the cortical follicles when there is a definite primary focus of infection, in contra-distinction to the scattered blood-infected glands, in which the tubercles are central (Fraser). (6) Before making a decision as regards treatment, the following points must be considered: (a) Will conservative treatment, i.e., fresh air, cod-liver oil, X rays, ultra-violet rays, etc., suffice in a particular case? (b) Is the administration of tuberculin indicated or helpful? (c) Is operation indicated, and if so, should it be a limited operation, or a wide dissection of the glands *en bloc*? (d) Does a combination of conservative and operative treatment lessen the extent of the latter?

Unfortunately, surgical opinion is very much divided on these issues. The reviewer recommends, in nearly all cases in children (unless in the case of very poor children), a thorough trial of conservative measures before resorting to operation. The conservative measures include not only general hygienic treatment, but also heliotherapy, artificial or natural, or both, according to circumstances, and the administration of tuberculin. Tuberculin is administered in the form of bacillary emulsion. When conservative treatment has been thoroughly tried for two or three months, the further management of the case depends upon whether there is marked improvement, a stationary effect, or progress of the disease towards caseation. In other words, find and remove the primary focus, persist in conservative treatment if the patient's circumstances permit; await result of this treatment before recommending operation, and perform localized limited operations other than wide dissections. If it is decided that hygienic treatment cannot be carried out properly, removal of the glands is advisable; there is nothing to be gained by removing the primary focus and allowing the child to return from hospital to dirt and squalor; the progress of the disease under such circumstances is certain.

R. M. Downes,¹ while not attaching any great importance to the administration of tuberculin, commences with a dose of 0.0001 mgrm. of bacillary emulsion, with a gradual increase of dosage. He asks the question, "Does

any treatment short of complete excision cure the disease?" The answer will generally be in the affirmative, but Fraser and others express considerable doubt. To decide whether to employ surgical treatment, and how, the different types of cases must be considered. Downes thinks that the risk of dissemination of the tubercles from operation may be ignored. He asks, "What are the arguments in favour of excision?" The chief one is based on the conception that in the great majority of cases the disease is purely local, and that the glandular infection results from a primary focus drained by the infected glands. If the infected glands and the primary focus be removed, cure is rapidly attained. The time factor may be a very important matter when frequent visits to the hospital involve the question of the patients' wages or the child's education.

Downes comes to the following conclusions: (1) In a large proportion of cases moderate enlargement of the cervical glands in children is tuberculous in nature. (2) In a certain number of cases the first manifestation of the condition is an acute abscess. (3) The tonsil is so frequently the unrecognizable primary focus of the disease that tonsillectomy should be a routine measure in all cases. (4) Except in infants primary excision should be carried out, unless the patient lives under good hygienic conditions and can be kept under careful observation. (5) Caseating glands should be aspirated or incised and closed, not drained. Excision is practicable and preferable as long as the skin has not broken down. (6) Curettage is only justifiable when a chronic sinus has formed. (7) When there are scarring and multiple sinuses, excision will improve the appearance. This is not advisable until all sinuses be healed. (8) Tuberculin and heliotherapy are indicated in all cases. (9) X-ray treatment is undesirable before radical operation. It is most valuable when sinuses are present, or in infants.

J. M. Hanford² thinks that: (1) Operation is indicated in a large number of patients with tuberculous cervical lymph-glands. (2) After time and conservative treatment have done their work, a later removal, if needed, is always worthy of consideration. (3) The results with conservative treatment (including the simpler operations) are so good that only those radical operations are done which are relatively easy and devoid of nerve and vein damage.

Ultra-violet Ray Therapy in Peritoneal and Glandular Tuberculosis of Children.—H. J. Gerstenberger and S. A. Wahl³ discuss this, basing their reports on the observation of ten cases. A quartz mercury vapour arc lamp (so-called Alpine lamp) was used in each case. The writers think that tuberculous peritonitis is highly amenable to this form of therapy, and that glandular and osseous tuberculosis is likewise benefited. Of the glandular forms of tuberculosis, the mesenteric is most rapidly improved; next, the mediastinal; and last, the peripheral.

REFERENCES.—¹*Med. Jour. of Australia*, 1924, July 5, 469; ²*Ann. of Surg.* 1924 Dec., 885; ³*Jour. Amer. Med. Assoc.* 1924, Nov. 22, 1631.

TYPHOID FEVER. (See also PARATYPHOID FEVERS.) J. D. Rolleston, M.D.

EPIDEMIOLOGY.—The thirteenth annual report issued by the *Journal of the American Medical Association*¹ on typhoid in the sixty-nine cities in the United States with a population of more than 100,000, shows the typhoid mortality according to the geographical divisions of the United States Census Bureau. The cities of the New England group had for the most part exceedingly low typhoid rates. In two cities in this group (Fall River and Hartford) there were no typhoid deaths in 1924. In the Mid-Atlantic States more than half the cities reported rates of less than 3. New York had a higher typhoid mortality in 1924 than for several years, owing to contaminated oysters, as

many as 650 excess cases of typhoid fever in New York being attributed to this source. The cities in the South Atlantic States had an excellent record, Baltimore and Washington reporting the lowest typhoid rates in their history. The cities in the East North Central States have maintained on the whole excellent records. The four cities in the East South Central States showed more unevenness than those of any other group. Louisville had the surprisingly low mortality of 1.9 per 100,000, while Nashville had a rate of 20.4, and Memphis one of 41.2. The cities in the Mountain and Pacific States maintained about the same relative position as for the last ten years. (See also MEDICAL ANNUAL, 1925, p. 486.)

ETIOLOGY.—In view of the numerous epidemics of typhoid fever attributed to raw oysters grown in polluted waters, the following experiments are of interest, as they conclusively prove the importance of preventing contamination at any time from the beginning of the growth of the oyster to its ultimate consumption. E. O. Jordan² found that shell oysters contaminated with typhoid bacilli by floating them for an hour in sea-water to which typhoid bacilli had been added, and then kept at ice-box temperature (5° to 8° C.), contained living typhoid bacilli as long as 24 days. There was no evidence of multiplication, but rather of diminution, with the passing of time. F. O. Touncey and J. L. White³ found that when shucked oysters were contaminated with typhoid bacilli and stored at 98°, 70°, and 45° F., *B. typhosus* survived in the oyster fluid in considerable numbers for 1, 4, and 22 days respectively. When living shell oysters were contaminated with large numbers of typhoid bacilli and stored at 70° and 45° F., the bacilli survived in the fluid within the shells at the former temperature for 8 days, and at the latter temperature, which is the ordinary icing temperature of the trade, for 60 days.

SYMPTOMS AND COMPLICATIONS.—G. Caussade and H. Le Rasle⁴ record six cases of the *pseudo-malarial type* of typhoid fever first described by Jaccoud, which occurs in defervescence or at commencement of convalescence. The attacks may be bi-quotidian (rare), quotidian (most frequent form), tertian (rare), or occur at intervals longer than three days (very rare). They may be of short, moderate, or long duration. The end of the attack is marked by sweating and a fall of temperature, which is sometimes very sudden and may be as low as 95.4°, but after the attack the temperature may remain above normal, oscillating for some days about 100.4°. Polyuria is frequent at the end of the attacks, sometimes amounting to three litres in the twenty-four hours for several days. In the diagnosis, cholecystitis, pyelonephritis, and malaria must be excluded. The prognosis is always favourable.

W. Fletcher and J. E. Lesslar⁵ report a case of *typhoid septicaemia without typhoid ulcers*. The patient was an old Chinese labourer from whose blood two strains of *B. typhosus* were isolated. Death took place about six weeks after the commencement of the illness. At the autopsy there was no marked thickening or inflammation of the gall-bladder, but an agglutinable strain of *B. typhosus* was cultivated from it. There were two old pigmented scars just above the ileocaecal valve, but there were no typhoid ulcers. It was an open question whether the patient was a chronic carrier and the septicaemia the result of infection from an old focus in the gall-bladder, or whether on the contrary the gall-bladder had become recently infected as the result of the general septicaemia.

J. Chalié⁶ states that *Lesieur's sign*, i.e., impairment of resonance at the right base due to pushing upwards of the liver by the distended colon, occurs early in typhoid and is present throughout the height of the disease. Lesieur, who first described the sign in 1908, found it present in 80 per cent of his cases. Chalié noted it in 65 out of 85 cases, or in 77 per cent, while enlargement of

the spleen was present in 85 per cent, rose spots in 60 to 65 per cent, and ulcers on the soft palate in from a fifth to a sixth of his cases. Lesieur's sign, therefore, possesses some diagnostic importance. It also has some prognostic value, as it is more likely to be absent in mild than in severe cases.

G. Tizianello⁷ reports two cases of *hemiplegia*, the only examples of this complication which he has met with in more than a thousand cases of typhoid fever in the course of seven years. [The reviewer has seen only one example in the course of twenty-five years.—J. D. R.] Tizianello regards the hemiplegia in both cases as due to thrombosis following typhoid arteritis.

Landry's paralysis, of which Chalié, Ducroux, and Schoen⁸ report an example following an apparently mild attack, is a very rare complication of typhoid fever, there being barely ten cases on record. In the present case paraplegia developed suddenly when the temperature was normal, the upper limbs and medulla became rapidly involved, and death from asphyxia took place in forty-eight hours. Histological examination showed intense chromatolysis of the cells of the anterior cornua and bulbar nuclei. P. Gerbeau,⁹ who describes an illustrative case in a man of 36, states that the essential features of *Korsakoff's psychosis* in typhoid fever, as in other infections and intoxications, are amnesia of fixation, fabulation, false recognition, and euphoria. As a general rule it is not accompanied by polyn neuritis. The prognosis is usually grave, but in Gerbeau's case complete recovery took place.

P. J. A. L. Alain,¹⁰ who has collected 16 cases of typhoid or paratyphoid *thyroiditis*, states that 62 per cent already had a goitre before their attack of enteric, 19 per cent came from a country where goitre was endemic, and 19 per cent had no previous history of this kind. In 75 per cent of the cases thyroiditis occurred in convalescence, and in 25 per cent a long time afterwards—9 years in one case and 25 years in another. In 55 per cent a pure culture of *B. typhosus* was obtained, in 6 per cent of *B. paratyphosus A*, and in 13 per cent of *B. paratyphosus B*, while in 19 per cent *B. typhosus* was associated with another organism. In 6 per cent the cultures were sterile, and in 6 per cent one part of the thyroid was sterile, while another part contained virulent organisms. Alain's case occurred in a girl of 15, who had had a goitre for a year. Inflammation of the right lobe of the thyroid developed in the fourth week of typhoid, and suppuration ensued, numerous typhoid bacilli being found in the pus. Signs of dysthyroidism, such as tremor and slight exophthalmos, were present. Complete recovery followed evacuation of the abscess.

H. M. Greenwald and H. Eliasberg,¹¹ who report a case in an infant of 16 months, state that only fifty odd cases of *peritonitis without intestinal perforation* have been reported in typhoid fever. With the exception of one in a child 12 years old, noted by Wilson in 1886, all the previous cases were in adults, and this is the first which has been described in an infant. Three distinct opinions are held as to the cause of the condition: (1) It occurs by direct extension from the lesions in the intestine. (2) There is a migration of the organisms from some viscus in the abdominal cavity, most frequently the small intestine, appendix, or mesenteric glands. (3) Infarcts are formed in the spleen, thus paving the way for migration of the organisms. The fact that the infant in the present case made an uneventful recovery and improved rapidly after laparotomy suggests that neither splenic infarcts nor broken-down mesenteric glands were the predisposing factor. As no typhoid bacilli were found in the exudate, the peritonitis probably resulted from direct extension from the inflammatory lesions in the intestinal tract.

C. Vasilescu Popesco and G. Litarczek¹² report the second case on record of rupture of an aneurysm of the abdominal aorta following *ulcerative aortitis*

in typhoid. The first case, which was that of the Roumanian statesman Take Jonesco, has been previously noticed (*see* MEDICAL ANNUAL, 1924, p. 492).

While much has been written about the changes occurring in the leucocytes during typhoid fever, comparatively little attention has been paid to the red cells in this disease. M. Stanzani¹³ has recently collected from the literature five cases of *pernicious anaemia*, including one of his own, which occurred at the height of typhoid fever. Four of the cases were in women and one in a man. There was usually no significant family history, and the personal antecedents were of little importance. The anaemia developed in the second or third week of typhoid, and was manifested by a rapidly progressive yellow coloration of the face. Various types of temperature were encountered in the different cases. Rose spots were usually absent, whereas bilious vomiting, and various hæmorrhages, such as epistaxis, bleeding from the gums, hæmatemesis, hæmaturia, and intestinal hæmorrhages, were frequent. Three cases recovered and two died. The strain of organism isolated did not show any morphological or biological features to differentiate it from the typical typhoid bacillus. Stanzani's patient was a woman, age 40, who gradually recovered after having a blood-count of 1,250,000 red cells, a hæmoglobin value of 28, and intense anisocytosis with a few megaloblasts and normoblasts.

After a review of the literature, in which they show that there is no uniformity concerning *leucocytosis following typhoid perforation*, E. M. Livingston and W. H. Squires¹⁴ record their observations at the Bellevue Hospital, New York, where, among 2215 typhoid cases admitted from 1905 to 1924, 69, or 3.11 per cent, developed intestinal perforation, confirmed by operation or necropsy. Blood-counts were made on 55 cases, with the result that in 85 per cent there was no leucocytosis, and in 70 per cent no rise of any degree. On the other hand, cases of typhoid fever without perforation frequently showed leucocytosis, but in association with other complications, such as acute cholecystitis, acute appendicitis, otitis media, pneumonia, phlebitis, wound infections, and local abscesses. The writers, therefore, conclude that leucocytosis occurring during typhoid fever points to other complications than perforation of the intestine, and emphasize the untrustworthiness of these variable counts for diagnosis.

PROPHYLACTIC INOCULATION.—M. Bloch¹⁵ gives the following statistics illustrating the incidence of enteric fever among the inoculated. Among 2337 cases of typhoid or paratyphoid fevers in which the diagnosis was established by blood cultures, 1249, or 53.5 per cent, had not been inoculated at all; 619, or 26.4 per cent, had been incompletely inoculated; and 469, or 20.1 per cent, had been completely inoculated. In about half the cases of the last group the attack of enteric developed between the sixth and eighth month, after which period there was a marked decrease in the number of cases. During the first twelve months following inoculation by T.A.B. vaccine, paratyphoid fever A was most frequent, but after the first year the incidence of typhoid fever was greater. As regards the severity of the attacks in the two groups of vaccinated and unvaccinated, only 23 per cent of the deaths occurred among the vaccinated, whereas 77 per cent of the deaths were among those who had not been inoculated at all, or only incompletely, or a long time previously.

TREATMENT.—J. Chalié and A. Tour¹⁶ treated 44 cases of typhoid fever by intravenous injection of *Hexamethylenetetramine*, associated with baths at a temperature of 82.4°. Almost every patient was given a daily dose of 10 c.c. of a 20 per cent solution, which was equivalent to 2 grm. of formine. The treatment was continued until the temperature became normal, which required from two to three or four to five days. The injections were well borne as a rule, and shock was exceptional. Although formine taken by the

mouth gives rise to hæmaturia, this complication was not observed in this series. With few exceptions the injections were followed by a diminution of diarrhœa, stupor, and fever, an increase of diuresis, and a general improvement in all the typhoid symptoms.

Diet.—In a paper based on the study of 760 typhoid patients treated at the Royal Prince Alfred Hospital during the last thirteen years, V. J. Kinsella¹⁷ concludes: (1) The old strict diet is deficient in caloric requirements. Such diet consists of a feed every two hours of peptonized or citrated milk or whey and albumen-water, each feed being made up of 2 to 5 fluid oz. (60 to 150 c.c.). (2) It results in severe wasting in prolonged infections. (3) During convalescence the hunger becomes ravenous. (4) With a diet of adequate caloric value the extreme wasting and hunger are not seen. The diet in this case consists of 2 pints of milk, 6 oz. of cream, 4 oz. of sugar, 3 or 4 eggs (in flips, custard, or boiled), 2 oz. of fish, 4 oz. of bread, and 2 oz. of butter. This makes approximately 3000 calories. (5) The mortality is slightly less, being 11.5 per cent on liberal and 11.6 on restricted diet. (6) Complications are not more frequent. (7) The anorexia which is so common in typhoid fever must be considered a difficulty, but in spite of it the 2000 to 3000 calories mark can easily be reached.

Treatment of Carriers.—W. H. Vosburg and A. E. Perkins,¹⁸ who report seven illustrative cases, recommend that in operations for the cure of a carrier the appendix as well as the gall-bladder should be removed, as the appendix is frequently the seat of acute inflammation during the course of the fever, and therefore may be the source of continued pollution of the intestinal tract at other times. In six of the seven cases, typhoid or paratyphoid bacilli were found in the appendix as well as in the gall-bladder, while in the remaining case the gall-bladder and appendix were negative.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 813; ²*Ibid.* 1402; ³*Ibid.* 1404; ⁴*Presse méd.* 1924, 745; ⁵*Ind. Med. Gaz.* 1925, 29; ⁶*Progrès méd.* 1924, 619; ⁷*Policlínico*, 1924 (Sez. Prat.), 1065; ⁸*Bull. méd.* 1924, 1456; ⁹*Thèse de Paris*, 1924, No. 203; ¹⁰*Thèse de Bordeaux*, 1924-5, No. 55; ¹¹*Amer. Jour. Dis. Child.* 1925, xxix, 365; ¹²*Presse méd.* 1925, 806; ¹³*Riforma Med.* 1924, 1063; ¹⁴*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1020; ¹⁵*Médecine*, 1924, vi, 226; ¹⁶*Lyon méd.* 1924, 781; ¹⁷*Med. Jour. of Australia*, 1925, i, 183; ¹⁸*Surg. Gynecol. and Obst.* 1925, xi, 404.

TYPHUS FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—G. Stuart¹ states that typhus, which had been doubtless introduced by Turkish troops from infected war fronts, raged in epidemic form in Palestine during 1916 and 1917 up to the time of the British entry and for many subsequent months. The period of maximum incidence ended by April, 1918, although from then until March, 1919, 121 cases were recorded. From April, 1919, to December, 1920, only 17 cases were notified, and from 1921 to the end of the first quarter of 1924 there were 137 cases, of which 63 occurred in 1921, 33 in 1922, 35 in 1923, and 6 in the first quarter of 1924. Of the 137 cases, 85 were Jews. Only six deaths occurred—a mortality of 4.4 per cent.

PATHOLOGY.—According to M. Tuschinsky,² the blood in typhus is characterized by a moderate leucocytosis, an increase in the neutrophil cells, a displacement to the left (Arneth), lymphopenia, monocytosis, and an absence of eosinophils. At the height of the disease, Türk's irritation cells are usually found in the peripheral blood. Cells are often seen in the stage of mitosis. In severe cases myelocytes and metamyelocytes are also found. Well-marked monocytosis is usually present in patients who are in a state of severe intoxication with pronounced cyanosis, dusky eruption, petechiæ, and a feeble pulse. After massage of the site punctured, such as the lobe of the ear, the number of monocytes is increased ten or twelve fold.

SYMPTOMS AND COMPLICATIONS.—C. T. Urechia and S. Nichalescu³ record a case in a boy, age 15, who, after an attack of typhus, showed a *change of character* consisting in disobedience, impulsiveness, and rudeness. Unlike the similar changes occurring in epidemic encephalitis, syphilis, and trauma, the disturbance was only transitory, and disappeared in two months' time. Another remarkable feature of the case was the persistence of cerebrospinal lymphocytosis three years after recovery, although the Nonne-Apelt, Wassermann, and Pandy reactions were negative. G. Wethanopoulos⁴ reports a case of *giantism* in a youth, age 17, following an attack of typhus three years previously. The patient, who before his attack was noticeable for his stunted growth, showed a remarkable increase of weight after it. No skiagram of the skull could be taken, but there were no symptoms such as headache or vertigo to suggest acromegaly.

DIAGNOSIS.—According to G. Stuart,¹ the Weil-Felix reaction is positive at some time or another within the first twelve days of the disease in 100 per cent of the cases in a serum dilution of 1-80 or more. Even in extremely mild cases the titre of the serum may be as high as 1-1000 or more. Failures to obtain positive results may be due to: (1) variations in the day of appearance of the reaction, (2) 'zones of inhibition' or 'zones of reaction' occurring in the lowest dilutions. This occurrence can be obviated by heating the serum prior to the performance of the test for thirty minutes at 56° C.

TREATMENT.—J. C. Dianderas⁵ successfully treated 25 cases of typhus without a death by supplementing the usual treatment with subcutaneous injection of an *Emulsion of Turpentine* (1 c.c. of a mixture of 10 c.c. of alcohol at 40° and 10 c.c. of turpentine; 4 c.c. of a 0.5 per cent solution of sodium chloride). The dose was doubled when the temperature was above 100.4°, and the injections were continued until it dropped to 96.8°.

REFERENCES.—¹*Jour. R.A.M.C.* 1924, 271; ²*Folia Hæmatol.*, 1924, xxx, 84; ³*Arch. Internat. de Neurol.* 1925, xviii, 1e sér. 44; ⁴*Deut. med. Woch.* 1924, 1153; ⁵*Crónica med.* 1924, 320.

TYPHUS, TICK. (See TICK-TYPHUS.)

UNDULANT FEVER. (See MALTA FEVER.)

URETERS, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

Eisendrath¹ emphasizes the value of *ureteropyelography* in the diagnosis of disease of the upper urinary tract, and states that patients should be warned carefully to abstain from taking much food or fluid for at least six hours previously, particularly when sodium iodide solution is to be the medium used. Even sterile water injected into the renal pelvis of some individuals will cause reflex nausea, vomiting, and even symptoms of collapse, but these are much less likely to be severe if the alimentary tract is empty.

In cases in which it is necessary to obtain a specimen of urine from one or both kidneys, but in which for some reason—such as extensive bladder ulceration or irritability, impossibility of obtaining a clear medium, stenosis, displacement or distortion by some local condition of the ureter or its orifice—it is impossible to *catheterize the ureters* by the ordinary method, Andrew Fullerton² recommends exposure of the ureter through a small muscle-splitting incision over the iliac fossa and the passage of a catheter through a small incision in the ureteral wall. A case is described in which this proceeding was of distinct value. Alternative methods which have been described in the literature are catheterization of the ureters through an open cystotomy wound; the use of a segregator; lumbar incision with aspiration of the urine from the renal

pelvis; and, finally, temporary ligature of the ureter on the side which is considered to be the one diseased, through an incision in the groin, followed by the collection of the urine from the bladder. The writer's method is to be preferred to any of these, especially in the type of case for which it is most likely to be required, viz., renal tuberculosis with extension to the bladder. With careful technique and careful suturing of the ureter there should be no extravasation of urine. In cases of tuberculosis of the kidney, if a thickened ureter is found on one side it need not be further disturbed, all that is necessary being to obtain a specimen from the opposite ureter.

D. Petillo³ considers that some factor other than a mere narrowing of the ureteral orifice is required for the production of a *ureterocele*. Experiment shows that if the ureter is ligated, peristalsis in the portion distal to the ligature first becomes weaker and then may disappear completely. Similarly, a pathological condition damaging or destroying the nervous elements regulating the muscular peristaltic mechanism of the ureter may produce a disturbance varying from a more or less pronounced impairment of the physiological functions of the distal portions of the ureter to complete paralysis. Two facts of importance in connection with the possible causation of *ureterocele* are emphasized by the writer: (1) The peculiar features presented by the musculature of the ureter in its intramural part, viz., the division of the longitudinal muscle-fibres into two bundles, one of which passes into the interureteric ridge, whilst the other runs to the internal urinary meatus, forming the lateral limit of the trigone, so that the lowermost portion of the ureter is made up of merely a weak layer of circular muscular fibres covered with mucous membrane; (2) The anatomical relations of the intramural portion of the ureter to surrounding structures, especially in the male. These relations indicate how readily an inflammatory process, as for example in the seminal vesicle, may involve the lower portion of the ureter and damage the ganglionated plexus of nerves, which has been shown by Satani to be particularly well developed on the lower end of the ureter, and so affect the muscular functions. As regards treatment, the writer considers that destruction of the *ureterocele* by trans-urethral **Fulguration** is the method of choice.

Hepburn⁴ draws attention to a condition of spasm of the circular muscle-bundles of the upper urinary tract described by Brodel, which he regards as a frequent cause of *ureteral obstruction*, and in this connection the muscle of the trigone, especially that of the interureteric bar, plays an important part. Division of the interureteric bar, with plastic repair of the resulting incision, together with either incision of the muscle of the intramural portion of each ureter down to the mucosa on the lines of Rammstedt's operation for pyloric stenosis, or dilatation of the intramural portion of the ureters with bougies, or both, is a procedure he has carried out several times with beneficial results in cases that did not yield to simple dilatation of the ureters with bougies.

Fuller,⁵ as the result of investigations carried out at the Surgical Clinic at the University of Cape Town, finds that *kinks and strictures* of the ureter as revealed by pyelo-ureterography can be placed in several more or less well-defined groups: (1) Inflammatory kinks, commonly associated with pyelitis of a recurrent nature and due to the distortion of the ureter as a result of the contraction of inflammatory exudates in the peri-ureteral tissues. Little or no renal displacement is found as a rule, but pyelitis and more or less pelvic distention are always associated. The writer has demonstrated the condition at operation by catheterizing the ureter prior to exposure of the kidney, after which normal saline solution is injected into the renal pelvis, and then any adhesion or other apparent cause of kinking or obstruction is dealt with, unless the condition of the kidney demands nephrectomy. If the kink is associated

with undue renal mobility, nephropexy is performed. If any obvious stricture is found in association with the kink, this is dealt with either by subsequent dilatation from below through the cystoscope, or at the time by dilatation from above after opening the renal pelvis. (2) A distinct type of kink, the 'hair-pin bend', is quite different in origin, being associated with more or less prolapse of the kidney, whereas the ureter retains its normal attachment to the peritoneum, so that its upper point of attachment corresponds to the site of a marked kink, for the relief of which the writer performs nephropexy unless definite disorganization of the kidney has occurred. Cases are found in which the characters of the above two groups are combined; but whereas the first type is not uncommonly associated with actual stricture formation, this is seldom the case with the second type. (3) Kinks and strictures resulting from the presence of aberrant blood-vessels. The above three conditions are found in the region of the uretero-pelvic junction or just below it, but strictures may also be found at the level of the upper part of the sacro-iliac joint, in the neighbourhood of the uretero-vesical junction, and at the ureteral orifice.

W. S. Pugh⁶ states that he considers *acquired non-tuberculous stricture* of the ureter to be a definite pathological entity, met with most commonly in patients of between 20 and 40 years of age, as the result of traumatism, focal infection of the ureter, or extension to it of an inflammatory process by direct continuity of tissue. It occurs, he thinks, more commonly in the course of a gonorrhoeal infection than is generally supposed, and he describes in detail a case which is of interest in this connection. Ureteral spasm may at times cause resistance to the passage of a ureteral catheter so great as to lead one to suppose that a definite stricture is present. Steady pressure in such cases usually overcomes this resistance, which may be met with in any part of the ureter. The symptoms of ureteral stricture are "pain, which may be sharply localized at the point of stricture or over the kidney, the latter often being due to back-pressure"; frequent and urgent micturition are often complained of, and vesical and even rectal tenesmus may be present. Hæmaturia is a frequent symptom, and is most apt to occur during severe attacks of pain. While, in some, the pain is a dull ache and is almost constant, more commonly it occurs in paroxysms with intervals free of pain. Gastro-intestinal symptoms have been noted, while chills and fever are common, particularly where there is evidence of urinary infection. A carefully taken history, examination of the urine, and pyelo-ureterography, together with observation of the results of treatment by dilatation with suitable ureteral bougies, are, in the writer's opinion, the main factors in establishing a diagnosis of stricture of the ureter.

N. P. Rathbun⁷ also discusses *acquired non-tuberculous stricture* of the ureter, and states that, while the condition may occur at any part, it is most commonly found in the lower third of the ureter. Ureteral strictures may be single or multiple, and are frequently bilateral, may occur merely as a linear constriction, or may involve two or more inches of the ureter. As regards pathology, ureteral or peri-ureteral inflammation is followed by round-celled infiltration, fibrosis, and contraction. The writer groups the etiological factors as follows: (1) Direct extension of inflammatory processes from neighbouring organs such as the bladder, the broad ligament, and Fallopian tubes in the female, the seminal tract in the male, the sigmoid colon on the left side, and the retrocæcal and pelvic appendix on the right, either by direct continuity of tissue or through the lymphatic vessels. (2) Ureteral traumatism inflicted at abdominal operations, especially those involving the pelvic viscera in the female. (3) One or more attacks of pyelitis, pyelonephritis, and ureteritis, many of which occur and pass unnoticed during infancy. The writer considers

that those cases that do not respond to adequate treatment in the early stages are already the subjects of early stricture formation, persistence of symptoms being due to the absence of adequate drainage of the affected renal pelvis, and he is of opinion that in many cases of pyelitis of pregnancy, and especially of the puerperium, ureteral stricture is an important underlying etiological factor. (4) Blood-borne infections from remote foci of infection such as the teeth and tonsils. Other causes not falling within one or other of the above groups are tuberculous infection extending from the renal pelvis or bladder, and congenital narrowing which is occasionally noted at the ureteral orifice, in the intramural portion, or, less commonly, in other parts of the ureter. Stricture as a complication of urinary lithiasis is common, but, here again, in many cases the calculus formation is secondary to inadequate drainage the result of a pre-existing ureteral stricture.

It has been stated that these strictures are rarely if ever noted during routine post-mortem examination, and are seldom if ever observed on the operating-table. This is because the ureters are not often completely examined except when special attention has been directed to them, and cases presenting the symptoms of ureteral stricture rarely come to autopsy. The pathologist, like the urologist, will not find these strictures unless he looks for them. The symptoms are very variable; they may be similar to those resulting from the presence of ureteral stone, namely, repeated attacks of ureteral colic with entire absence of any symptoms in the intervals; or frequent and urgent micturition may be the most prominent or only symptom, while occasionally hæmaturia may result and be regarded as being of the nature of 'essential hæmaturia'. The urine may or may not be infected, so that diagnosis depends upon a complete urological investigation, to include pyelography and uretero-graphy.

Treatment of non-tuberculous ureteral stricture is carried out by means of **Gradual Dilatation**, the writer employing for this purpose large ureteral catheters and bougies (6, 8, 10, 12 French), and, for the higher degrees of dilatation, Walthour's dilator, which consists of a series of olive-shaped metal bulbs arranged 'in tandem-fashion' behind a silk gum-elastic bougie. The manipulation of the larger dilators, from 10 French upwards, is facilitated by the use of McCarthy's operating cysto-urethroscope. The writer does not use ureteral dilators of the Kollmann type, as he believes that their employment is not free from danger. Dilatation is repeated at intervals of 1, 2, 3, or 4 weeks according to the tolerance of the patient, and after each sitting a small quantity of a 25 per cent solution of **Argyrol** is instilled.

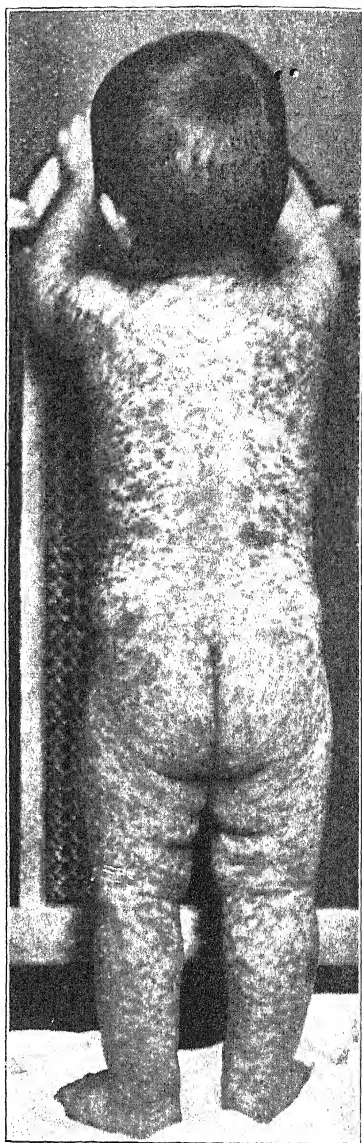
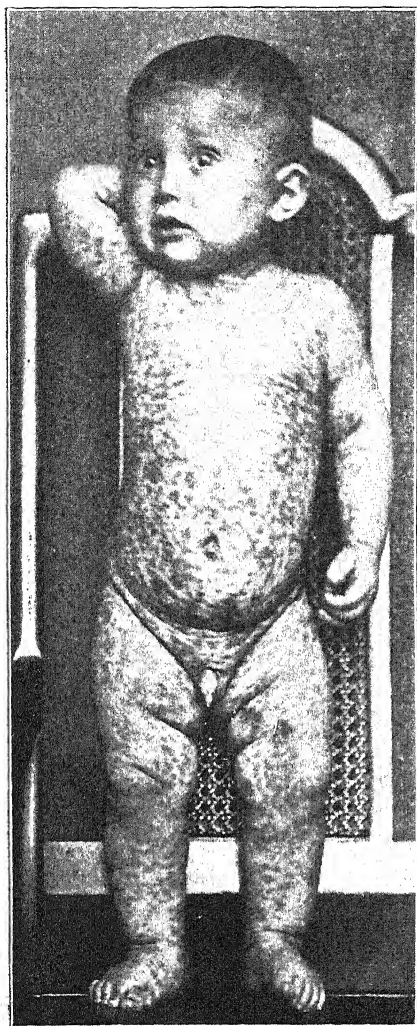
K. W. Monsarrat⁸ recommends *exposure of the pelvic portion of the ureter through a median suprapubic incision followed by peritoneal displacement* until the common iliac bifurcation is reached. At this point the ureter is found adherent to the peritoneum, and is then traced downwards to the level required. After dealing with the ureteral lesion, e.g., impacted calculus, the ureteral wound is sutured, and drainage provided for through a stab wound in the abdominal wall of the iliac fossa. [This operation was first described by Judd, and is in common use. One of the important advantages of the median approach is that median drainage is possible, as in the iliac incision the drainage tube lies across the iliac vessels and has been the cause of ulceration of these vessels and fatal hæmorrhage. By draining through the abdominal wall of the iliac fossa the advantage of median drainage is lost.—J. T.-W.]

REFERENCES.—¹*Ann. of Surg.* 1924, Nov., 712; ²*Brit. Jour. Surg.* 1924, xii, Oct., 351; ³*Surg. Gynecol. and Obst.* 1925, June, 811; ⁴*Ann. of Surg.* 1925, June, 1133; ⁵*S. Afric. Med. Rec.* 1925, Aug. 22, 352; ⁶*Ann. of Surg.* 1925, April, 839; ⁷*Boston Med. and Surg. Jour.* 1924, July 31, 193; ⁸*Brit. Jour. Surg.* 1924, xii, July, 192.



PLATE LVIII.

URTICARIA PIGMENTOSA



By kind permission of the 'Archives of Dermatology and Syphilology'

URETHRA, DISEASES OF.*Sir John Thomson-Walker, F.R.C.S.*

Hamilton Bailey and G. P. B. Huddy¹ have found that during the period 1908-22, 107 cases of *extravasation of urine* were admitted to the London Hospital, of which 65 complicated peri-urethral abscess, 20 followed traumatic rupture of the urethra, 13 followed injury to the urinary bladder, 7 occurred after suprapubic puncture, 1 after internal urethrotomy, and 1 was a case of extravasation occurring in a six-weeks-old infant with congenital stricture of the posterior urethra. When extravasation follows peri-urethral abscess, the determining factor is a virulent infection of the mucosa of the posterior urethra extending to the peri-urethral tissues. That the condition is not wholly due to a spreading cellulitis, however, is shown by the fact that urea can be demonstrated in fluid taken from the affected part. The mortality is high, death resulting from septicæmia or uræmia or both. In this series of 65 cases, 43 per cent died. The writers find that multiple incisions, together with bladder drainage by the perineal route, give the best results.

REFERENCE.—¹*Brit. Jour. Surg.* 1924, xii, July, 183.

URETHRA, RUPTURE OF. (*See PELVIS, FRACTURE OF.*)**URTICARIA PIGMENTOSA.***E. Graham Little, M.P., M.D., F.R.C.P.*

L. Hollander¹ notes two cases of urticaria pigmentosa in which a large thymus gland was demonstrated by X rays. The first case, an American boy, age 8 months, with generalized eruption, was treated with 50 mgrm. of Radium given at 1½ in. distance for four hours over the thymus. The dose was repeated a fortnight later, the same amount of radium for the same time, with ½ in. distance. Three months later the lesions were fading, but the boy was lost sight of. The second case was a Polish boy, age 16 months, also with a generalized eruption (*Plate LVIII*), and enlarged glands in the neck and groin. The treatment and subsequent development of the case are not specified.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1925, May, 611.

UTERUS, CANCER OF.*W. E. Fothergill, M.D.*

A committee appointed by the American College of Surgeons has studied records of cases of cancer of the cervix treated in the years 1914-19 inclusive, by operation, by radium, or by any other method. R. B. Greenough, of Boston, Chairman, has published a report upon 829 cases,¹ giving a full analysis and many interesting tables. He points out that the present report is only a preliminary one; but certain conclusions may be drawn from it. Of 829 cases of cancer of the cervix, 94 were free from disease three or more years after treatment. More than half of these cures were obtained by the use of Radium or X Rays without radical operation. There were no cures by cauterization alone. In 243 early favourable and border-line cases, Hysterectomy alone cured 1 in 3, with an operative mortality of 1 in 5. Radium with palliative cauterization cured about 1 in 3, and radium with palliative operation or alone cured about 1 in 5. It may thus be said that in early and favourable cases the choice between operation and radium is an open one. It must be remembered that the results of radium used with the technique of to-day are not yet available, but that they will probably be better than those now presented. In more advanced cases there were very few cures after either radiation or hysterectomy. The duration of life in unsuccessful early cases is somewhat greater after radium than after operation. The formation of rectovaginal and vesicovaginal fistulae occurred with nearly equal frequency with all methods of treatment. Radium, with or without X-ray or palliative operation, was the most important agency in the destruction of local disease in cases which

were not cured. The value of radium as a palliative in advanced cases is beyond dispute. In recurrence after hysterectomy radium provides the best treatment; a sufficiently large dose of radium is required to obtain destruction of the lesion. The treatment of cancer of the cervix with inadequate doses should be discouraged. This preliminary report of a representative committee upon cases selected as suitable and collected from a number of clinics appears free from bias, and therefore useful at the present time.

J. Ewing² considers that the unexpected success of radium treatment of cervical carcinoma seems attributable to two main factors: (1) The cervical tissues form a resistant filter, so that relatively large doses of radium can be inserted in the canal and in the tumour tissues; (2) The majority of cervical carcinomas resemble the basal-cell tumours, and are more susceptible to radiation than squamous carcinoma. On the other hand, the inaccessibility of cervical carcinoma will always render it very difficult to extirpate the organ without disseminating tumour cells. These facts will probably assert themselves sooner or later in the final decision as to the choice of treatment of cancer of the cervix.

Howard A. Kelly³ some time ago began to think that all cases of cancer of the cervix are inoperable, so to speak. The welfare of the patient is the first consideration, and, in his opinion, it is best served by radium therapy. Several other authorities have recently expressed similar opinions. While most surgeons strongly prefer hysterectomy in cancer of the body of the uterus, Kelly has recorded very favourable results after radium in this condition. W. H. Kennedy⁴ thinks that surgery should be reserved for cases in which radium is contra-indicated, and that cases should not be designated as operable or inoperable but as curable or incurable. The continuation of surgery in this condition cannot, he says, be construed as significant of a great measure of success, but rather as making the best of a bad job. Combining the reports of several large clinics, he finds that 40 per cent of cases are operable. Of these there is a mortality of 10 per cent, leaving 36 per cent of cases that come for treatment and survive operation. Of these it is claimed that a quarter remain well after five years; in other words, 9 patients are cured out of 100 that apply for treatment. Modern radium treatment, not confined to advanced and inoperable cases, will, this writer is convinced, give better results than these. But he gives a caution against the indiscriminate use of radium, especially in cases in which the bladder and the rectum are likely to be damaged.

J. Heyman⁵ reports on the results obtained at the Radium Home in Stockholm for the period 1914-21. He deals fully with 505 cases, and feels warranted in considering that the figures show between 26 and 30 per cent of cures after five years, although the percentage of inoperable cases was very large. The writer points out that in comparing the results of operable cases treated surgically with the same kind of cases treated by radium, we should bear in mind that the radium is responsible for a very small primary mortality—only 6 cases in 505. A large number of inoperable cases have remained free from recurrence for over five years. During the period 1914-18 these were 16.6 per cent of the cases treated, and this rose to 20 per cent in the years 1919-21.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1924, July, 18; ²*Radium Report of the Memorial Hospital, New York*, Second Series, 1923; ³*Therap. Gazette*, 1922, Nov. 15, 761; ⁴*Med. Jour. and Record*, 1924, Nov. 19, 146; ⁵*Surg. Gynecol. and Obst.* 1925, Feb., 161.

UTERUS, FIBROIDS OF.

W. E. Fothergill, M.D.

Present Status of Treatment.—James N. West¹ says that as time for observation has extended, facts which time alone could demonstrate have modified the views of his earlier years. For example, the number of 'fibroids' which

are really malignant growths is larger than was recognized. Some authorities estimate the incidence of malignancy in these growths at 2 per cent, others at 10 per cent. If this is averaged at 6 per cent, an important point is raised as to treatment. Again, the writer says that when myomectomy has been performed, the tendency for the formation of other tumours in the uterus subsequently is found to be greater than he had expected. Points like these make him feel that the field of radical operation should be extended to a limit beyond that which he had formerly considered to be the proper one. Assuming that the general health of the patient is good except for complications produced by the tumour, the writer would say that in women in whom childbearing is no important consideration, and who have a fibroid causing serious symptoms, a wise course is to do supravaginal hysterectomy, leaving one or both of the ovaries. All patients with pedunculated fibroids and submucous fibroids should be operated on. In pregnant women where the presence of a tumour seems a serious obstacle, operation should be done. Fibroid polypi, tumours of large size, those of rapid growth, those associated with inflammation of the tubes or ovaries, those causing pressure symptoms, and all those which cause bleeding in women past the menopause, should be removed.

This leaves, as suitable for treatment by X rays and radium, cases in which operative risk would be great on account of the systemic condition of the patient, and comparatively small tumours in women in whom the childbearing function has ceased to be a factor and where the artificial induction of the menopause is of no serious consequence. The operation of myomectomy may be extensively applied in women of childbearing age where this function is of importance. It is, however, more dangerous than supravaginal hysterectomy. The endocrine treatment of fibroids is hardly worth mention.

REFERENCE.—¹*Med. Jour. and Record*, 1924, Nov. 19, 145.

VACCINATION.

J. D. Rolleston, M.D.

K. Kato¹ studied the nature of the *leucocytosis* following vaccination in 153 children under 18 months of age, and found that there was always a definite leucocytosis both primary and secondary. The primary leucocytosis began on the third day after inoculation, and indicated the result of general reaction of the organism to the invading virus. The total white count in the primary leucocytosis was not so high as in the secondary, being about 13,300. The primary leucocytosis lasted about four days, reaching its maximum on the fifth day after inoculation. Secondary leucocytosis, which is the true leucocytosis of vaccination, begins on the twelfth day and lasts seven to ten days, the average count being 19,140. The total white count was at its maximum on the fourteenth day after inoculation, and was much higher than that found in the primary leucocytosis. A differential count made at various intervals after vaccination showed no significant variations from the normal.

Generalized vaccinia is a rare condition (see MEDICAL ANNUAL, 1920, p. 322), and is usually the result of vaccination having been performed on a person suffering from a pre-existing skin lesion. A. Drago's² case, which occurred in a male infant, age 28 months, is remarkable for the fact that the child had not had any previous skin disease. The eruption became generalized on the eighth day after vaccination. The temperature remained high for a fortnight, and there was considerable constitutional disturbance, but ultimately complete recovery took place.

The cases reported by F. Luksch,³ F. S. van Bouwdijk Bastiansee,⁴ and J. A. Prakken⁵ indicate that the *vaccine encephalitis* produced experimentally by A. Marie and Levaditi, and Harvier and Nicolau, in the rabbit may also occur

in the human subject. J. T. Terburg,⁶ on the other hand, maintains that there is no reason for regarding such cases as examples of vaccine encephalitis, but is of opinion that the virus of herpes or encephalitis dormant in the system can be activated by the process of vaccination.

REFERENCES.—¹*Amer. Jour. Dis. Child.* 1924, xxviii, 710; ²*Pediatrics*, 1924, 1045; ³*Med. Klinik*, 1924, 1170; ⁴*Nederl. Tijds. v. Geneesk.* 1925, 1, 1194; ⁵*Ibid.* 2018; ⁶*Ibid.* 2179.

VARICOCELE, PELVIC.

W. E. Fothergill, M.D.

This condition appears to have been described by Richet in 1860, and A. Palmer Dudley wrote on it in 1888. J. O. Polak and G. W. Phelan¹ find that the younger American gynaecologists barely mention its existence. They have, however, studied the work of seventeen authors and have written a useful collective review of the literature of the subject. They conclude that the condition must be admitted as a morbid entity which can be clearly defined from the anatomic point of view and may be independent of any ovarian or tubal lesion. These writers, however, like several previous ones, fail to distinguish between true varicocele, a primary condition, and secondary lesions caused by inflammation, subinvolution, and other primary lesions. They say, "The history is always significant. These patients either have been the subjects of repeated pregnancies, a twin pregnancy, a hydramnios, prolonged labour, or had an infection of the parametrial tissues following labour, and date their symptoms from this time". Nothing of the kind! The pelvic varicocele which is a morbid entity is a primary lesion, and occurs as often as not in single women who have never had any pregnancy or any pelvic infection. It is exactly comparable with varicocele in the male, and no doubt has the same etiology, whatever that may be. The anatomy of the pelvic veins in the female subject particularly favours distention of the veins of the pampiniform plexus, especially on the left side; and women, like men, can have varicose veins without either pregnancy or pelvic infection!

C. A. Castano² writes a further paper on the diagnosis and treatment of this condition. The majority of his patients have had no obstetric history, and no lesion of the uterus or appendages. They are not cured by medical treatment, and they wander from one gynaecological clinic to another, finally being regarded as subjects of the 'neurosis' which so often covers our ignorance. Castano has learnt to recognize varicocele in the female, and has published several accounts of it. He is now able, after extended experience, to confirm his statements. The operation he has employed for the radical cure of the condition has been adopted by Cotte, of Lyons, who has published a study of the subject.³ The writer notes as symptoms dull aching and sense of weight in the pelvic region, worse after standing, relieved when lying down, and exaggerated at the monthly periods. He describes a new symptom which he calls 'douleur érotique', or pain accompanying sex stimulation, which prevents or renders intolerable the sexual act. Leucorrhœa is another symptom, and menorrhagia is also observed. The varicose veins in the broad ligaments are palpable only if the patient is examined in the erect posture, or at least sitting up. The blood leaves them when the patient is lying down, so that in that posture no abnormality can be detected on bimanual examination. The writer adds that when the abdomen is open and the patient lying flat, nothing may be seen; but if the uterus is then compressed by the hand, the varicose veins in the broad ligaments fill up and become very evident.

TREATMENT.—The treatment is, in the writer's opinion, essentially surgical, just as in varicose veins in the scrotum or legs. Two methods have been used hitherto, namely, dissection of the veins followed by their ligation, or by

excision. The writer has found these operations difficult. They are of the same nature as those used for veins in the leg. Guided by the experiments of Richet, he observed that the veins in the broad ligaments are filled by reflux from the ovarian veins, which carry blood from the uterus, tubes, ovaries, and some from the vagina and the bladder. The left ovarian vein opens into the left renal vein without valves, while the right opens directly into the inferior vena cava. The writer finds in nearly all his cases two veins on each side which leave by the so-called tubo-ovarian ligament, and it is these which his operation attacks. They are emptied when the patient is lying flat, and filled when she is raised up. When they are cut across, venous blood escapes from the upper extremity in a continuous stream. The writer's operation consists in tying the two ovarian veins on each side of the body, where they leave the pelvis. The stages are as follows: Open the abdomen. Find the varices, compressing the uterus with the hand to fill the veins and demonstrate them. Expose the tubo-ovarian ligament and make a small incision through the peritoneum; dissect the vein or veins from the artery. Tie two catgut ligatures round each vein and cut between them. Tie the ends of the ligatures together. Close the incision in the peritoneum with catgut. Repeat the process on the other side of the body. The operation presents no difficulty, and the writer says it has been successful in removing the symptoms in 25 consecutive cases. (See MEDICAL ANNUAL, 1917, p. 400, and 1922, p. 332, for papers on pelvic varicocele by L. A. Emge, J. A. Wall, and W. E. Fothergill.)

REFERENCES.—¹*Amer. Jour. Obst. and Gynecol.* 1924, Nov., 664; ²*Presse méd.* 1924, Dec. 24, 1027; ³*Rev. franç. de Gynéc. et d'Obstét.* 1923.

VARICOSE VEINS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Fisher and Mensing¹ urge the importance of a careful investigation in so self-evident a condition as varicose veins. One patient with a history of typhoid fever appeared at first sight to have extensive superficial varicose veins. On raising the leg and emptying the veins a constriction was put on and the leg lowered; even after ten minutes the veins showed no filling; this indicated that the deep or perforating veins were thrombosed or varicosed. If the superficial veins had been removed, gangrene would probably have resulted. A few days later a patient was admitted whose case clearly showed the folly of hasty diagnosis, and at the same time tragically confirmed the necessity for the judgement shown in the first case. The patient had had varicose veins removed about two years previously. A few days later two of the toes became black, and it was obvious that at the time of operation no test was made to determine the patency of the deep or perforated veins. Subsequently it became necessary to amputate through the middle of the thigh, and the deep or perforating veins were found to be thrombosed. An entire extremity was sacrificed owing to the failure in the first place to apply a very simple test to the circulation.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, March 7, 728.

VASCULAR SURGERY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Ligation of the Abdominal Aorta.—R. Matas¹ reports a case of ligation of the abdominal aorta for aneurysm at the bifurcation. The patient was alive a year and five months after ligation; death was caused by a fulminating pulmonary hæmorrhage from a tuberculous cavity developed in the course of an acute generalized tuberculosis. The aortic aneurysm was almost completely obliterated by a dense clot. The process of cure had been practically effected at the time of the fatal pulmonary hæmorrhage.

Aneurysm of the Aorta treated by Wiring.—G. H. Colt, C. J. Marshall, and C. P. G. Wakeley² report three cases. The first case, a patient 78 years of age, was diagnosed as one of saccular abdominal aneurysm in the region of the celiac axis. For fourteen months the patient had suffered from pain in the back. [This backache is interesting; it is a very constant symptom of abdominal aneurysm. A possible explanation is the stretching and tugging of the posterior peritoneum. It is not only stretched, but continually kept in motion by the pulsation of the aneurysm. It is common knowledge that any pull on the mesentery or the gall-bladder, etc., transmitted to the posterior parietal peritoneum during an abdominal operation under a local anæsthetic, gives rise to pain in the back.] A wisp of wire $3\frac{1}{2}$ in. long was inserted by Colt's method. The patient made good progress for a week, when continuous vomiting set in, and he died seven days and twenty hours after operation. At the post-mortem examination it was found there had been no rupture of the sac, and no leakage at the site of puncture, but there was acute dilatation of the stomach and duodenum as far as the third portion, where it was adherent to the sac of the aneurysm.

The reviewer (W. I. de C. W.) has wired three cases of abdominal aneurysm after the method of Colt: one case is still alive fourteen years and six months after operation; the second case died during the war about five years after operation, from leakage of a secondary dilatation; and the third died, as in Colt's case, from acute dilatation of the stomach after gastro-enterostomy about a week after operation. Thus three cases have died of acute dilatation, and Colt thinks that the condition arises either as a result of change occurring in a consolidated sac, or as a result of some nervous or vascular change induced by the trauma.

Gangrene: Sympathectomy.—A discussion on *senile gangrene* by the Medical Society of London³ was opened by Sir Anthony Bowlby. The condition is twenty times commoner in males than females, and is by no means confined to old age. The speaker said that in his opinion, in every case of definite senile gangrene, one or both tibial arteries were occluded. In certain patients, apart from old men, it was not wise to come to the conclusion that the condition would necessarily spread, nor that it would not. The best course was to wait and see to what extent the collateral circulation was capable of dealing with the part. A very few days would decide the point. When senile gangrene was not limited to the toes, but spread to the dorsum of the foot, amputation should be carried out without delay. In those cases in which delay seemed advisable, opium was recommended; it dilated the capillaries and materially aided the circulation of the blood through neighbouring channels to the damaged part. The operation should be performed immediately above the knee; there was nothing to be gained by going far above the knee. It was suggested that a skiagram should be taken in order to determine which arteries were calcified and which were not. Sampson Handley suggests that in these cases there is an element of spasm or vasoconstriction, and prefers Leriche's operation of sympathectomy or his own method of injecting pure alcohol into the outer coat of the artery. It was pointed out at this discussion by Sir Anthony Bowlby that in a large proportion of all cases of senile gangrene there was a temporary glycosuria, and many such had been erroneously diagnosed as diabetic gangrene. In true diabetic cases the gangrene was usually of the moist variety, and the prognosis correspondingly bad. [The reviewer has under treatment at present a stout plethoric man, age 80, in whom gangrene of the fourth toe is established. The patient is a victim of old-standing bronchiectasis, and a bad surgical risk. The only reasonable treatment in such a case is to expose the femoral artery, and either denude it or inject alcohol into the

PLATE LIX.

ARTERIAL SYMPATHECTOMY

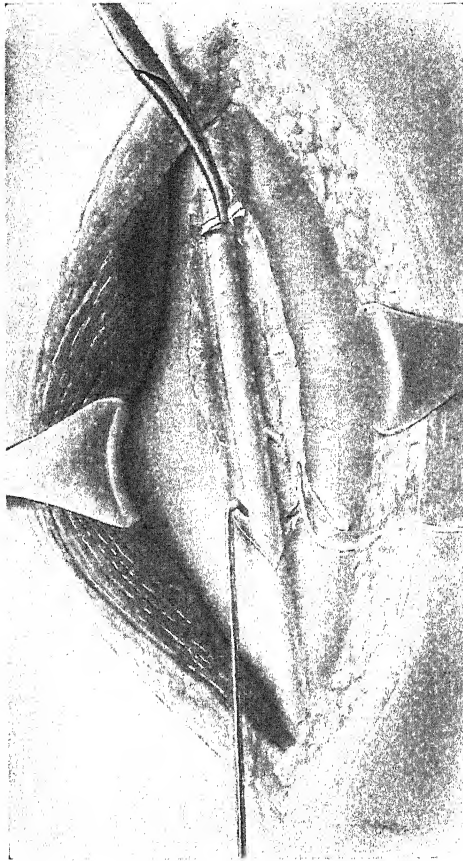


Fig. A.—Operative field, showing artery standing clear, with common sheath cut.
Tapes being passed under the artery.

*Plates LIX-LXI by kind permission of
'Surgery, Gynecology, and Obstetrics'*

PLATE LX.

ARTERIAL SYMPATHECTOMY—continued

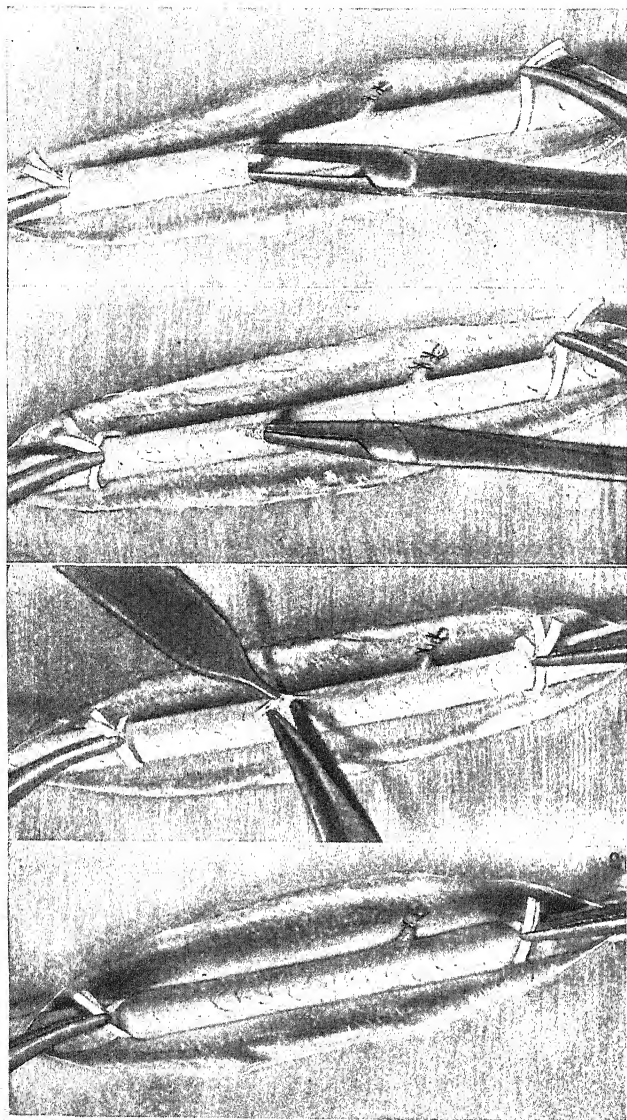


Fig. B.—Artery dissected free from surrounding tissue and held up with tapes. Branches are tied and cut between the ligatures so that the vessel may be lifted out of its bed and twisted and turned at will. *Fig. C.*—Thumb forceps picking up a bit of the adventitia, and scissors snipping it. *Fig. D.*—Clamp placed in small opening of adventitia. *Fig. E.*—Clamp in adventitia opened to receive scissors.

PLATE LXI.
ARTERIAL SYMPATHECTOMY—continued

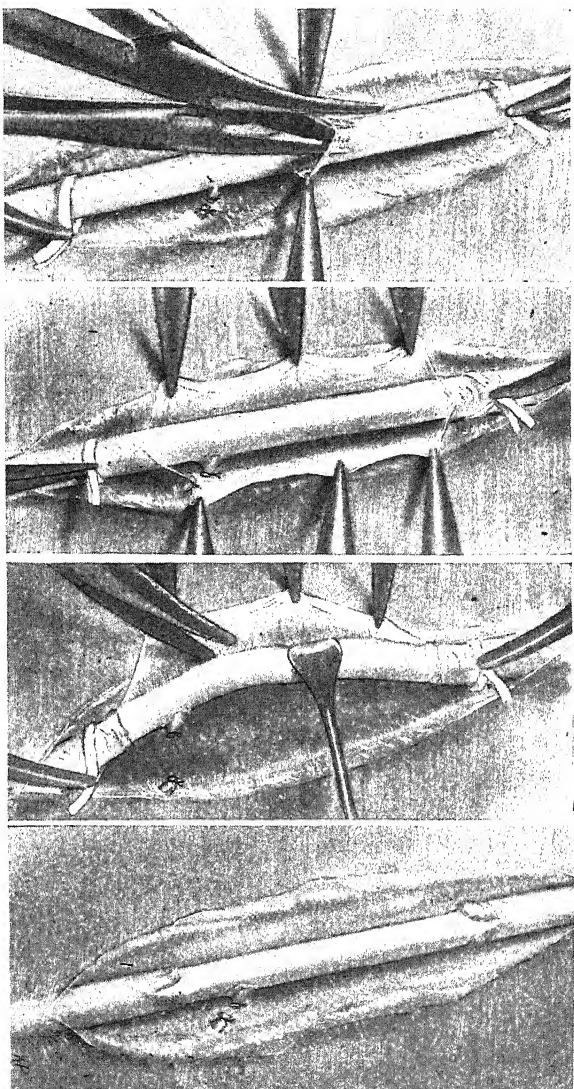


Fig. 7.

Fig. 6.

Fig. 2.

Fig. 1.

Fig. 1.—Artery being rotated and adventitia dissected free with scissors. Clamps on one side of the adventitia have been removed. Fig. 2.—Artery lying in its bed, showing smooth, glistening coat of the muscularis. Adventitia cut at either end of the denuded area to avoid any constriction which might arise because the adventitia rolls up.



sheath as recommended by Sampson Handley. The results of Leriche's operation have been variable. Meticulous removal of the adventitia is the first step of the operation.]

B. M. Bernheim⁴ states that *sympathectomy* is not the simple operation some men think it is, and it is not devoid of danger. About two inches of the artery should be denuded, and the best place is well up in Scarpa's triangle in the leg. A longitudinal slit is first made through the enveloping sheath of the vessels, exposing the artery for a distance of three or four inches; tapes are passed around the vessel to lift it up and to control any accidental hæmorrhage. At this stage every branch, large and small, should be cut between two ligatures, thus allowing the vessel to be lifted out of its bed and twisted and turned at will. A little warm salt solution is gently dropped on the artery at this stage. The outer coat will now take on a whitish, cotton-like appearance, and will stand out clearly. With the finger one can feel how freely movable it is on the firmer coat beneath; should one grasp it with a mouse-toothed forceps, he will find that it can be lifted away from the underlying coat and cut with the points of a pair of scissors. Release of the forceps will now reveal a small round opening in the adventitia into which the ends of a straight clamp can be introduced. The various stages of the operation are admirably seen in the accompanying illustrations from Bernheim's paper (*Plates LIX, LX, LXI*). In some cases the adventitia seemed to be in two fairly distinct layers; it is there that the difficulty lies. When the first layer has been removed, the vessel should again be soaked in warm saline solution, and a second filmy network will become apparent. It is to be removed exactly as was the first coat.

Bernheim asks the question: "What, then, is the field for sympathectomy and what are the indications for its use in this field, if field it has? The answer is that there is a great group of vascular disorders of the extremities which for the most part eventuate in gangrene, and it is here that one will find the real field for peri-arterial sympathectomy."

REFERENCES.—¹*Ann. of Surg.* 1925, Feb., 457; ²*Brit. Jour. Surg.* 1925, xiii, July, 109; ³*Lancet*, 1924, ii, 1122; ⁴*Surg. Gynecol. and Obst.* 1925, June, 828.

VENTRICLES, PUNCTURE OF.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The cerebrospinal fluid can be withdrawn for clinical study by various routes. Not many years ago, lumbar puncture was considered adequate for most purposes; later, puncture of the cisterna magna through the occipito-atlantal ligament marked an advance in our clinical procedures. And now ventricular puncture, whereby the fluid is withdrawn directly from the lateral ventricles, has established its usefulness both for diagnostic and therapeutic purposes.

Firstly, as to the *technique of ventricular puncture*. In skilled hands it is a comparatively easy operation. In infants it is performed through the anterior fontanelle; in older patients it is conveniently carried out by means of a special drill and cannula, of which the most convenient model is that devised by Goetze, which has a bore of only 1.5 mm., and contains a blunt stilette projecting from its end. Puncture of the lateral ventricle is performed from the vertex. In a vertico-internal puncture the needle enters about 1 cm. from the middle line, being directed downwards and slightly outwards, piercing scalp and cranium in succession. In vertico-external puncture, which in the adult is rather more convenient, we start about 4 or 6 cm. from the middle line, choosing a spot about 4 cm. in front of the upper end of the Rolandic fissure and directing our needle downwards and slightly inwards. To puncture

the descending horn in the temporal lobe, we take a line vertically through the external auditory meatus or a little behind, and make our puncture several millimetres above the upper edge of the pinna; the needle is directed so that, when looked at from the front, it points towards the outer canthus of the palpebral cleft.

The depth of a vertical puncture is somewhat deeper than that of a temporal puncture; in the one case it is a few millimetres more, in the other case a few millimetres less, than the number of centimetres which go to the circumference of the head. The needle, charged with its blunt stilette, is passed into the drill hole and thrust slowly into the brain, millimetre by millimetre, and the stilette is withdrawn after each advance. The depth at which cerebrospinal fluid begins to flow is noted; then, on continuing to thrust in the needle, the second depth at which the flow ceases. The difference between these two figures corresponds to the lumen of the ventricle along the line of puncture. Normally this lumen measures several millimetres. A lumen which is narrowed, possibly to complete closure, is a sign of cerebral œdema. Enlargement of the ventricle can similarly be observed and watched from day to day by successive punctures, e.g., in cases of hydrocephalus.

Ventricular puncture, when skilfully carried out, causes no more discomfort than an ordinary lumbar puncture, but a fresh bore-hole requires to be drilled on every occasion.

The quantity of fluid in the two lateral ventricles can also be compared. If ventricular punctures be carried out at symmetrically situated spots, precisely equidistant from the middle line, the cavity of the lateral ventricle should normally be encountered at the same depth from the surface on both sides, and the same amount of fluid should be present in both ventricles. If one lateral ventricle on ventricular puncture seems much larger than its fellow, or if one ventricle is not encountered at the normal depth or in the usual position but seems to have been dislocated, this suggests the presence of some gross mass displacing the ventricle, probably a supratentorial tumour. With one ventricle smaller than the other, the tumour is on the side of the smaller ventricle.

Not only can the intraventricular pressure be readily measured, but the composition of the ventricular fluid, as regards cells, organisms, and chemical constituents, can be accurately observed and compared with fluid from the cistern and from the spinal theca. Thus, for example, in three cases of general paralysis of the insane, Cestan, Riser, and Pères¹ found that whereas the spinal fluid showed the classical lymphocytosis with a positive Wassermann reaction, the ventricular fluid was free from cells and gave a negative reaction. In three other cases of general paralysis the ventricular fluid gave strongly positive Wassermann and benzoin reactions, but showed no lymphocytosis and no excess of albumin. In 9 out of 10 other cases of cerebral syphilis of various types the changes in the ventricular fluid were much less marked than in the spinal fluid. Again, in a large series of observations in children with cerebrospinal fever, Lewkowicz² makes the notable observation that active meningococci are found exclusively in the ventricles, being conveyed there by the choroid plexuses, whilst the spinal fluid contains many times more polymorphs than the ventricular fluid, the meningococci here being ingested by the leucocytes. These differences between the ventricular fluid and that in the subarachnoid space are probably due to two factors: (1) The presence or absence of inflammatory reactions in the ventricles; and (2) The direction of the fluid current, which is always from the ventricles to the subarachnoid space and never in the reverse direction.

REFERENCES.—*Ann. de Méd.*, 1924, xv, 201; *Lancet*, 1924, ii, 487.

VISCEROPTOSIS.*Robert Hutchison, M.D., F.R.C.P.*

Netschajew¹ has put forward a novel theory of the pathogenesis of dropping of the organs. He finds, as the result of studying the peritoneal ligaments, that they contain unstriped muscle fibres running in longitudinal bundles. He considers that these are innervated by the sympathetic, and that relaxation of their tone allows the viscera to drop. From this point of view the occurrence of visceroptosis in neurasthenia is the consequence and not the cause of the nervous state. This theory is certainly new, and if the existence of muscle bands in the peritoneal ligaments is confirmed (it does not seem to have been pointed out before), some of the difficulties in the way of explaining visceroptosis might be resolved.

REFERENCE.—¹*Munch. med. Woch.* 1924, Sept. 12, 1269.

VITAMINS AND SUNLIGHT TREATMENT (from a Public Health Standpoint).*Joseph Priestley, B.A., M.D., D.P.H.*

As to the influence of sunlight on human health, there can be no doubt. What, however, is more interesting and more important, from the point of view of the public health, is that the sunlight may be natural or artificial. The physical effects are well-known and admitted. Growth (normal and abnormal), bone formation, etc., are influenced favourably by violet and ultra-violet rays, the influence being similar to that of the so-called accessories to foods or vitamins. It may be that the comparison may be taken a stage farther, and that it may be proved that the vitamins are ultra-violet rays, and the ultra-violet rays are vitamins. Exposure to the 'rays' improves the health generally, and arrests, if not cures, pathological conditions (or, at least, tends to do so), and, indirectly, causes a state of immunity against infectious diseases in persons exposed to such rays. This, however, is not all. The 'rays' are now claimed to have a mental effect—intellectual output being increased.

Sunlight is a brain food, and raises the 'spirits' of the patients, thereby enhancing the chances of recovery from disease. Want of sunlight causes stunted bodily growth and rickets, and impoverished mental capacity, whereas sunlight (natural or artificial) has the opposite effects. The mental effects have been carefully worked out, as shown by the following table of comparison between two sets of children, viz., (a) Alton children (Lord Mayor Treloar Cripples' Hospital), suffering from surgical tuberculosis, and (b) children from two London special schools for the physically defective, suffering from heart diseases, infantile paralysis, rickets, tuberculosis, etc. :—

	a. Alton Hospital	b. Special Schools
Number of cases ..	62	117
Average age ..	11·85 years	11·13
Average mental age	10·17 „	9·18
Average mental ratio	90·40 „	82·50

(N.B.: The mental ratio is a figure obtained by dividing the mental age (as measured by the test) by the chronological age, and multiplying the result by 100. The mental test used was the Stanford revision of the Binet-Simon scale or Burt's revision.)

The conclusion drawn from the figures set out above is that the mental difference in favour of the Alton children is due to the treatment which they receive in the hospital, i.e., sunlight treatment. The conclusion was only arrived at after carefully excluding other factors, e.g. (1) heredity (or innate

ability), (2) educational facilities, (3) nature of disease from which the selected children were suffering.

What is, practically, the best form of ultra-violet ray treatment? The quartz mercury vapour lamp is of two kinds—the one with the arc working in vacuo, and the other with the arc working at a little above atmospheric pressure. The former lasts for about 1000 hours, when it requires renewal. For this reason, the latter is preferable, whilst, in addition, the rays from the atmospheric lamp are fifty times stronger, and the lamp itself, in working, is cheap and inexpensive, with minimum wear and tear and no renewals (as in the case of the vacuum lamp). The ultra-violet rays output can be easily tested by interposing between the lamp and the eye a large square of cardboard with a circular aperture in the middle, covering the opening with a piece of Chance's ultra-violet glass, which acts as a filter, obstructing the visible prismatic rays and allowing the ultra-violet rays to pass; these rays are screened by a uranium salt glass, which fluoresces or becomes self-luminous. In all lamps there is a tendency to a depreciation in the ultra-violet output, due to the devitrification of the quartz caused by the action of the arc. Some burners devitrify more quickly than others, owing to dissimilar currents. The quartz must be re-fired or the arc portion renewed, as may be found necessary, from time to time. How the ultra-violet rays act still remains a mystery. The general view is that they cause chemical changes of a catalytic nature in the blood through action on or via the pigment cells of the skin. It does not appear to be necessary to continue the application of the ultra-violet rays until pigmentation of the skin is visible—a very important decision, as there is a general belief that a sunburnt skin is a sign of health. Such is not the case. On the contrary, a pigmented skin may prevent, or interfere with, the ultra-violet rays penetrating. Experience shows that, in sunlight treatment, the more pigmentation, the longer the time of exposure necessary. For rickets, marasmus, general debility, and malnutrition, artificial sunlight treatment has a great future, and the medical practitioner would be well advised to instal a simple lamp for use in his private consulting rooms, if he (or she) wishes to keep abreast of the times.

VOMITING, IMMEDIATE TREATMENT OF.

Robert Hutchison, M.D., F.R.C.P.

Lehman and Gibson¹ recommend the administration of from 2 to 8 oz. of 2 per cent solution of **Common Salt** (given cold) in the immediate treatment of all forms of vomiting due to 'reverse peristalsis' in the upper alimentary tract. Over-dosage must be avoided, or a 'salt diarrhœa' may be set up. The only type of case in which the treatment is contra-indicated is that in which salt may be a poison; nephritis with œdema is an example. The writers give details of a large number of cases of vomiting of different sorts in which the treatment proved useful, and express surprise that it has not been used before. As the method is simple and harmless it seems worthy of trial.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1925, April 25, 1259.

WARTS.

E. Graham Little, M.P., M.D., F.R.C.P.

H. C. L. Lindsay¹ reports a case of complete cure of a very extensive eruption of warts upon the scalp, which had resisted local X-ray treatment, fulguration, and local and internal use of mercury, by two intravenous injections of 6 grm. of **Neoarsphenamin**.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1924, Oct., 471.

WATER PURIFICATION IN SWIMMING-BATHS.

Joseph Priestley, B.A., M.D., D.P.H.

Much attention has been given to the subject of filtration (and sterilization) of the water in swimming baths, so as to make the same water available for use again and again, with consequent economy for ratepayers. At present, it is customary to renew the water in swimming-baths three times a week, new fresh town's water being used for the purpose. This method is costly according to the volume of water used. It has been suggested, therefore, and the plans have been tried in many towns, that the water might be re-used after being filtered, sterilized, and aerated. What form of sterilization is available that is trustworthy? The chlorination of the water is stated to be satisfactory, and to render the water sterile and fit to be used again without danger to the health of the users. The chlorine is the bactericide, and is produced by mixing chloride of lime in the water (10 per cent strength of the whole solution is sufficient). The water must not be allowed to become acid or neutral, but must be kept alkaline to assist the coagulation of the suspended matters for the purpose of facilitating their retention in the filtering medium to be used afterwards. For this purpose, soda solution or alumina sulphate solution may be added for coagulation purposes. The sulphate of alumina is converted into hydrate of alumina, which entangles the fine particles of suspended matters, which cause discoloration of the water, thus preparing them for the filter so as to be caught readily therein. Soda keeps the solution alkaline and so assists coagulation of suspended matters.

Two processes, therefore, are involved—sterilization and filtration—and both are necessary. It is true that filtration depends for its success not only upon mechanical straining but also upon oxidation (due to nitrifying organisms); but the latter is practically negligible in the case of the water of swimming-baths, and other definite sterilization methods are called for such as have been described above. That sterilization—and efficient sterilization—is necessary goes without saying, when it is remembered that all sorts of germs (beneficent and otherwise) are to be found in swimming-water that has been used. Gonococci, diphtheria and typhoid bacilli, tubercle bacilli, influenza germs, staphylococci and streptococci are all to be found, and many others in addition. The picture is a terrible one, and, once realized, will ensure the obvious preventive methods being taken—not only sterilization but also filtration. Heating the water is also necessary. After sterilization and filtration, aeration is necessary, and this is obtained from an aerator, by which the sterilized and filtered water is oxygenated before being re-used by other bathers. Estimates show that it is cheaper for an authority to sterilize and filter and aerate the water of swimming-baths, and so use it again and again, than to provide new, fresh water each time, or at least three times a week. The saving naturally varies in amount according to the use made of the baths, but in large towns a great yearly saving may be effected financially, not to speak of the benefit to the public health.

WHOOPIING-COUGH.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—In a paper on the *effects of whooping-cough on the heart*, P. V. Ledbetter and P. D. White¹ relate their experience of 232 cases which they had kept under observation for periods ranging from one month to seven years. No danger to the heart as the result of pertussis could be found in the 232 cases, although one child had endocarditis and another congenital heart disease before admission.

I. Langer² reports a case in an infant of 11 months which was remarkable for the occurrence of *repeated convulsions* followed by recovery, and for the

development of *amaurosis*, which lasted for four or five weeks and then completely disappeared. As in the absence of hæmorrhages in the eye, skin, and kidneys there were no symptoms indicating damage to a blood-vessel, and as on the other hand there were signs of serous meningitis, Langer concluded that there was a spread of inflammation of the pia mater to the cortex in the region of both occipital lobes.

DIAGNOSIS.—Rousseau-Saint-Philippe,³ who emphasizes the frequency of incomplete and abortive forms, remarks that pertussis is not always accompanied by a whoop, but should be suspected in the presence of an obstinate cough, most marked at night and accompanied by vomiting or expectoration. The cough can be made characteristic by pressure with the thumb on the crico-thyroid region or trachea, or by tickling the uvula.

The drawbacks connected with bacteriological diagnosis are exemplified by the experience of Emmy Best,⁴ who employed the method of Chiewitz and Meyer, which consists in growing the Bordet-Gengou bacillus on a medium composed of glycerin-potato-agar and defibrinated blood. She found that it was not only an extremely laborious method, but that it was by no means reliable when the results were negative. She also emphasizes the fact that the macroscopic appearance of the colonies is by no means sufficient for the diagnosis of pertussis bacilli. In the case of suspected whooping suddenly developing in a child, the practical value of the method will be limited even under the most favourable circumstances, as the preparation of fresh media and the growth of the colonies require several days.

PROPHYLAXIS.—V. Gillot⁵ recommends prophylactic injection of the whole blood of those who have had whooping-cough at some time in their life, as being a much simpler method than injection of convalescent serum, which is often difficult to obtain (see MEDICAL ANNUAL, 1924, p. 514). During a severe epidemic at Algiers in 1924, Gillot employed this method, and found that all the children injected before the period of invasion were effectively protected, and that those who were treated at the onset had only mild attacks.

Rousseau-Saint-Philippe³ recommends *early and prolonged isolation*, and does not approve of the period of staying away from school being shortened as recommended by some observers on the ground that the Bordet-Gengou bacillus is hardly ever found in the sputum after three weeks, for, as he points out, the organism may be lurking in the recesses of the bronchi long after that time.

From his experience of *vaccine prophylaxis* in 69 cases, 16 of whom contracted the disease, while 53 escaped, E. Kramár⁶ gained the impression that prophylactic inoculation, though not an absolute protection, is likely to be successful in epidemics occurring in schools and hospitals. The experience of C. A. Aldrich⁷ is similar. Among 17 children exposed to infection who received three prophylactic injections of Bordet-Gengou vaccine in doses of two, four, and four billions subcutaneously, only 4 developed the disease.

TREATMENT.—Opinions are still divided as to the value of **Vaccine Therapy** in pertussis. J. Taillens⁸ indeed, as the result of over twenty years' experience, concludes that antipertussis vaccine does not possess any certain therapeutic value. On the other hand, E. Kramár⁶ found vaccines useful if employed within the first fortnight for shortening the duration of the disease and making it milder, whereas if they were employed later on they were of no benefit. Aldrich,⁷ who treated 65 cases with vaccines without any complications occurring, found evidence that in some cases the disease was aborted in the catarrhal stage, and that under vaccine treatment the attacks were slightly milder and shorter than usual. F. van der Zande,⁹ who obtained good results in 41 out of 56 cases by this method, attributes failures in the vaccine treatment of

whooping-cough to there being two strains of pertussis bacilli. A vaccine may contain only one strain of bacilli, when the disease is due to bacilli of the other strain. It is therefore important that a pertussis vaccine should contain both strains of bacilli. The best results from vaccine therapy, according to A. H. Meyer, M. Kristensen, and E. Sørensen,¹⁰ appear to have been obtained in the Faroë Islands, where a vaccine containing 10,000 million Bordet-Gengou bacilli per c.mm. was used in about 2100 cases. The vaccine was given subcutaneously three times, with four days' interval between the injections. The first dose consisted of 0.5 c.c., the second of 0.7 c.c., and the third of 1 c.c.

C. Elgood¹¹ claims good results from Rectal Injection of Ether, which is given by a full-sized male catheter attached by a small glass tube to a larger bored rubber tube with a funnel at the upper end. The ether is mixed with an equal amount of olive oil, the dose being 1 drachm of the mixture for every year of age.

P. W. Lamb¹² recommends Garlic in the form of Tinet. Allii, either alone or in combination with the usual expectorant mixtures. When there is much gastro-intestinal catarrh, the garlic is given in the form of an ointment, which is rubbed into the abdomen, a binder being applied to the body afterwards. (See also RADIOTHERAPY—PERTUSSIS.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1925, lxxxiv, 1022; ²*Jahrb. f. Kinderh.* 1924, cvii, 242; ³*Bull. de l'Acad. de Méd.* 1925, xciii, 470; ⁴*Arch. f. Kinderh.* 1925, lxxiv, 93; ⁵*Bull. de l'Acad. de Méd.* 1925, xciii, 176; ⁶*Monats. f. Kinderh.* 1925, xxix, 697; ⁷*Amer. Jour. Dis. Child.* 1925, xxix, 486; ⁸*Rev. méd. de la Suisse Rom.* 1925, 3; ⁹*Nederl. Tijds. v. Geneesk.* 1925, i, 1575; ¹⁰*Acta Paediatrica*, 1925, iv, 21; ¹¹*Brit. Med. Jour.* 1925, i, 963; ¹²*Clinical Jour.* 1925, liv, 275.

WORMS, INTESTINAL.

Robert Hutchison, M.D., F.R.C.P.

Round Worms.—Goldschmidt¹, after reviewing from the clinical and pharmacological sides all the usual anthelmintics, concludes in favour of Oil of *Chenopodium* as a remedy for round worms. It should be given in keratin-coated capsules, the size for adults containing 16 drops and that for children 6 drops. The capsule is given at 8, 10, and 12 o'clock. Two hours later the patient takes 1 oz. of castor oil, and three hours later has a dose of salts and an enema. The aperient dose has to be a large one, seeing that chenopodium, besides paralysing the worms, interferes also with peristalsis. Used in the above way the remedy is safe, speedy, and efficient.

Thread-worms.—Lorentz² finds that the oxyuris develops from ova only in the anal ring, and that if the anal region is thoroughly washed after every stool the worms will be eradicated.

REFERENCES.—¹*Munch. med. Woch.* 1925, Jan. 16, 52; ²*Med. Klinik*, 1925, Jan. 18, 95.

XANTHOCHROMIA.

E. Graham Little, M.P., M.D., F.R.C.P.

Marcel Labbé¹ comments on a yellow coloration of the skin (xanthochromia) observed more frequently in diabetics than other persons, but also seen in non-diabetics. The colour is chiefly marked upon the palms of the hands, and on the face, especially the ears and the nasolabial folds. The diagnostic feature from jaundice is the absence of the coloration of the conjunctiva. There is no excess of bilirubin or urobilin; nor is there excess of cholesterin. The pigment is a lipochrome, which is present in vegetables, especially carrots, and in the yolk of eggs. The clinical observation that diabetics are prone to this pigmentation, which cannot be altogether explained by the ingestion of pigment-carrying foods, suggests that there is an element of deficient secretion, probably indicating a defective digestion of fats. Restriction of foodstuffs

containing pigment should form part of the treatment ; and the following list gives the percentage of this pigment in some of the common articles of food : yolk of egg, 27.5 ; spinach, 19.7 ; maize, 8.3 ; green salads, 3.6 ; carrots, 2.5 ; butter, 2.1 ; milk, 0.9. Abstention from these items should be advised.

REFERENCE.—¹*Presse méd.* 1925, Jan. 7, 17.

X-RAY DIAGNOSIS. (*See also* HEART, EXAMINATION OF; *and under various specific diseases.*) C. Thurstan Holland, Ch.M.

The outstanding feature of X-ray work in 1925 was the First International Congress of Radiology held in London in July. Some 250 foreigners attended, and the membership reached close on 500. A large number of papers were read in the three sections into which the Congress was divided—namely, Radiology, Physics, and Electrotherapeutics—and the majority of these will be published in the two sections of the *British Journal of Radiology*. The importance of this Congress was emphasized by the fact that 22 different nationalities were represented, and that at a delegate meeting continuity was established. It was decided to hold succeeding Congresses at three-yearly intervals, the next one being fixed for Stockholm in 1928, with Dr. Gösta Forssell as President.

Two of the most important papers read were : (1) In the Physics section by the Duc de Broglie, entitled "Absorption of α and γ Radiations and the Secondary Radiations which accompany them", which will be published in the *British Journal of Radiology* (Röntgen Society Section)—this was the Sylvanus Thompson Memorial Lecture ; (2) The Mackenzie-Davidson Memorial Lecture by Sir Berkeley Moynihan¹ on "The Relationship of Radiology and Surgery". The chief subjects dealt with from a surgeon's point of view were the œsophagus, ulcer of the stomach, cancer of the stomach, diverticula, the colon, and the gall-bladder ; but therapy was not neglected, and reference to the treatment of carcinoma before, after, and during operation was made. The author in two cases has opened the abdomen, removed the patient to the X-ray department, and has had hard X-ray therapy applied directly to inoperable growths of the stomach. The abdomen was then closed. Seven weeks later in one case, and nine in the other, the abdomen was reopened and the growths were found so changed and shrunken that removal was possible. Both patients were alive and well two years later. One noticeable addition to the treatment was that in both two transfusions of blood were given.

In speaking of calculus, what finer tribute to the value of X-ray diagnosis can be imagined than the phrase used by Moynihan : "The change from the old days with the hesitation, the guess-work, the bitter and humiliating disappointments, to these days of confidence and precision, is almost immeasurable ; and it is to the devoted and skilful worker in the fields of radiology that we are grateful for the transformation". And again, when discussing gastric ulcer : "If the diagnosis of gastric ulcer is made, by no matter whom, let us agree that it is not to be acted upon by the therapist with drugs or weapons unless the radiologist confirms it." Altogether a most notable address, which, coming from a surgeon of the authority of Moynihan, should be of considerable help, and should assist materially in placing radiological work as carried out by medical experts in its true position as regards the science and art of medicine. It emphasized the value of this expert medical work as against the utterly valueless and dangerous 'taking of radiographs' by unqualified and medically ignorant people.

There is no doubt that the time has come to protest against this practice of radiology both in private and in hospitals by non-medical men, and it should

not be legally possible. A large number of post-graduates are now taking diplomas in radiology at Cambridge and Liverpool, in each instance after a definite and comprehensive course, and Edinburgh with its new radiological department and whole-time lecturer—Dr. J. M. Woodburn Morison—has also established a diploma. There should in the near future be enough trained medical men and women to make it possible for all hospitals to have experts in this branch of medicine attached. These should be entirely responsible for the whole of the work in their departments; and whilst much of the purely technical work can rightly be done by assistants who are not medically qualified, the reporting on cases and giving of opinions should be entirely a matter for the trained expert. With the enormous improvement which has taken place in X-ray work during the past few years, the art of diagnosis has become more difficult rather than easier, and the enormous responsibilities which a radiologist of repute has to shoulder are only possible when he combines radiology and pathology with a sound knowledge of medicine. To quote two examples only to drive this point home: The X-ray diagnosis between malignant disease of bone and many simple conditions is very often so difficult that it requires the utmost X-ray skill and knowledge, and even this is often of no use unless the radiologist is also a good clinician and knows his bone pathology very thoroughly. The other example is cancer of the stomach. It is essential that the definite diagnosis should be made as early as is possible if surgery is to be successful. The *early* diagnosis of cancer of the stomach cannot possibly be positively made, although the disease may be suspected, by the ordinary means of examination. A skilled radiologist can often make a positive diagnosis, and even if he is not in a position to dogmatize from the X-ray examination taken alone, he can prove some defect of the stomach which, when taken into consideration with the history and so on, clinches the diagnosis. It is quite certain that every patient of from forty to forty-five years of age who develops the slightest symptom of gastric disorder should be examined by means of a barium meal immediately. It should be the first thing done, and no treatment is justifiable before it is done. The tendency is to procrastinate when delay may be fatal.

X-ray work done by non-medical radiographers, or even by those medical men who have had no training or experience in this special work, is not only valueless, but is a danger to patients. Yet how often do we see young and just qualified men with some local influence, but no special qualifications, put in charge of hospital X-ray departments in spite of applications for the same post from a candidate holding a D.M.R.E. Many glaring instances of this have occurred during the past two years, and it is quite time that this kind of thing ceased. In many of the smaller hospitals it has been the practice to appoint a 'lay-radiographer' and then to put one of the medical members of the staff in the nominal position of being 'in charge of the X-ray department'. This again is a wrong and dangerous proceeding, and again those who suffer are the unfortunate patients. A remedy for these abuses will have to be found, not in the interests of medical men, but in the interests of the general public. One way out of the difficulty would be to appoint a qualified medical radiologist to be in charge of the departments of a group of hospitals, and all the reports on cases should emanate from him; possibly, and indeed probably, he should be a whole-time, paid, official; the routine work of the departments, for which he would be entirely responsible, could be carried out by a staff of trained assistants, none of whom should be required to express any opinion on 'the reading of the radiographs' taken. Such a method of dealing with this question would be easy in the case of Poor Law infirmaries and institutions, and would not be impossible even in cottage hospitals and

country districts. Experience during the war proved conclusively that it was possible to maintain a high standard of X-ray work by one man working on those lines, even when he controlled the work of many hospitals and at the same time carried on his own private work.

THE DIGESTIVE ORGANS.

Œsophagus.—See ŒSOPHAGUS, NON-OPAQUE FOREIGN BODIES IN.

Stomach.—Research work on the *normal movements of the stomach* has been carried out by E. D. McCrea, B. A. McSwiney, J. W. Morison, and J. S. B. Stopford,² and in an interesting paper their experimental work and the results arrived at are set out. This paper is concise and practical, and from the radiological point of view important. Experimental work on the stomach of rabbits, dogs, and cats is described and discussed in reference to X-ray findings in the human organ. The results of the investigation are stated, and a good bibliography is added.

Diverticula.—A. F. Hurst and P. J. Briggs³ report four cases of this rare condition, which may cause an error in X-ray diagnosis as simulating a gastric ulcer. These diverticula are invariably situated in the immediate neighbourhood of the cardia. In three out of the four cases the correct diagnosis was derived from the radiographic examination, and numerous radiographs illustrate the condition found and the points by which a differential diagnosis is reached.

Pyloric Stenosis and Pylorospasm.—A paper by C. G. Teall⁴ gives the conclusions arrived at from a radiological investigation of pyloric stenosis and pylorospasm in infants, and as the author has examined 120 cases during three years, and has carefully noted the X-ray findings in reference to the clinical aspect of these cases, his observations are noteworthy. He concludes that the X-ray examination is a valuable method of confirming the diagnosis of pyloric stenosis, and should be made whenever it is possible; he has seen no untoward result in any case. His other chief conclusion is that radiologically it is possible to distinguish between pyloric stenosis and pylorospasm, and that he is certain that the latter occurs as a clinical entity.

Syphilis of the Stomach.—A. S. Merrill,⁵ in a study of ten probable cases of this condition, points out that it is a late manifestation of syphilis, but not so rare as has been supposed. The possibility of syphilis should always be considered in atypical cases, that is, in those in which the X-ray findings show definite filling defects, etc., exactly as in malignant disease, but with the gross lesions of which the symptomatology does not agree. Three typical cases are given, with full detail and radiographs, and an extensive bibliography.

Sphincters of the Alimentary Canal.—Although not strictly speaking radiological, Hurst's⁶ paper should be carefully studied by all radiologists, and especially by those who are making examinations with the barium meal. The author deals with the cardiac, pyloric, ileocaecal, pelvirectal, and anal sphincters in a masterly manner.

The Colon.—S. G. Scott,⁷ writing on the opaque enema method for the X-ray examination of the colon, gives a very satisfactory and complete account of this procedure as carried out by himself, and the technique is described in detail. This careful technique ensures comfort for both patient and radiologist, and also minimizes the possibility of errors in diagnosis. A great point is made of the preparation of the patient—serious diagnostic errors may be made unless the bowel is certainly empty at the time of the examination. In the rest of this paper the author discusses *seriatim* all the different conditions which may give X-ray findings, and also suggests the points in differential diagnosis.

J. L. Kantor's⁸ paper, which is exceedingly well illustrated, deals with the X-ray study of certain anatomical abnormalities of the colon. This paper is based upon 62 cases found in a series of 668 gastro-intestinal examinations. It is not always an easy matter to map out the colon satisfactorily from a meal given by the mouth, and unless one is aware of the various abnormalities which may occur one is often puzzled by the X-ray appearances. The barium enema, however, clears up the diagnostic difficulties easily, and amongst other things Kantor shows examples of redundant colon, the pelvic colon extending over to the right side, reversed splenic flexure, double splenic flexure, and so on. Constipation and gas distress are the common symptoms.

THE THORAX.

The Infant Chest.—There is an interesting paper by W. W. Wasson,⁹ who has made an X-ray study of the infant chest as seen at birth, and this is illustrated by a large number of radiographs. The procedure was to X-ray the chest immediately on birth, and then 5, 10, 15 minutes, and 24 hours later, with a standard technique. An interesting point made out was that whilst before any act of inspiration there was no X-ray evidence of the infant containing any gas or air, simultaneously with the inspiration of air into the lungs, air showed in the stomach, and very shortly after this in the colon.

Pulmonary Tuberculosis.—J. H. Mather's paper¹⁰ on the value of X-ray examination in pulmonary tuberculosis should be read carefully. The author has had a large experience of chest work in connection with pensions, and amongst other things two points have forced themselves forwards. One is the large number of cases certified as tuberculous, and in which the disease was supposed to have been present for many years, who show no X-ray signs that the lung has ever been affected; and the other that X-ray evidence of extensive lung tubercle can be obtained in cases in which careful chest examinations fail to elicit positive evidence. In this paper five types of cases are described and noted in which the diagnosis of tubercle was made by the X-ray examination, and the reasons for the failure of the clinician to diagnose these cases are pointed out and commented on. The paper is well illustrated.

Miliary Tuberculosis.—H. Armstrong¹¹ discusses fully the question of the value of radiography in cases of acute miliary tuberculosis in children, and discusses the question of the X-ray appearances. He is definite on the point that miliary tuberculosis will often show up on the radiograph in the entire absence of physical signs (as apart from symptoms); but he does not explain why, in the presence of typical signs of the condition, radiography sometimes fails to demonstrate the lesion. This paper is not too convincing as regards the latter point, as the author has no post-mortem evidence to bring forward to prove it. Typical radiographs are used for illustration.

Hydatids of Lung.—C. Heuser¹² has had a considerable X-ray experience with hydatids of the lung, and in this paper illustrates the difficulties of diagnosis clinically, and also the points of differential diagnosis from the X-ray point of view. The radiographs reproduced indicate the ease with which a typical cyst can be shown and diagnosed; but they also show that in atypical cases great difficulty may arise, and indeed one case is illustrated which demonstrates that it was not possible to differentiate between pleurisy and cyst even from the X-ray.

Foreign Bodies in Trachea.—W. F. Manges' paper¹³ on the X-ray diagnosis of non-opaque foreign bodies in the trachea contains valuable information on the technique which is essential, and on the X-ray signs which are to be looked for. The paper is illustrated by a large number of radiographs. Obstructive emphysema of both lungs is the only real dependable sign to go on, but

associated with this are other minor findings which may assist in the diagnosis in difficult cases. A further important point made by the author is the necessity of several examinations, as these foreign bodies are apt to move from the trachea into a bronchus, and then the X-ray signs will alter from time to time according to the alteration in position. This variation in X-ray appearances is of considerable diagnostic importance.

Heart.—E. C. Cutler and M. C. Sosman¹⁴ describe several cases of *calcification* of the heart and pericardium in which a diagnosis of the condition was made during life by X rays. The paper is illustrated by radiographs in life and after death, and also photographs. The condition is apparently one sufficiently common to remember when making X-ray examinations of the heart and vessels; the author states that seventeen cases recognized radiographically during life have been reported. (*See also* HEART, EXAMINATION OF.)

THE GALL-BLADDER.

In the radiological examination of the gall-bladder a distinct advance has been made by the introduction of a new method, attributable to E. G. Graham and W. H. Cole.^{15, 16, 17} By introducing into the blood-stream a salt, opaque to X rays, which under normal conditions is excreted by the liver and passes into the gall-bladder, where it becomes concentrated, the latter organ can be visualized radiographically. Skiagrams of the gall-bladder area taken at definite intervals after the injection give information which can be translated into terms of normality or otherwise of this organ. The shadow of the normal gall-bladder containing the dye can be made out from four to five hours after the injection has been given. The shadow then increases in *intensity* (owing to the progressive concentration of the dye) up to anything between eight and twenty-four hours, after which it becomes less intense as the dye becomes diluted and passes out. A variation in *size* also takes place, the gall-bladder shadow being larger at the earlier examinations (five to eight hours) and then becomes gradually smaller. Failure of the gall-bladder to give an X-ray shadow, or scanty filling, or delayed filling, may be regarded as an indication of an obstructive cholecystic lesion (stones, adhesions, etc.). Similarly marked delay of emptying, or an unvarying size of the shadow, deformity of contour, mottling, or central defects, would indicate a pathological lesion (cholecystitis, adhesions, stones, growth, etc.).

The method was investigated by R. D. Carman and V. S. Counseller¹⁸ in America, and H. Cohen and R. E. Roberts¹⁹ in England. The result in each case was approximately the same—about 90 per cent successful diagnoses as proved by subsequent operation (*Plates LXII-LXIV*). The full technique and diagnostic features may be obtained from either of the papers referred to.

The salt first used for injection was tetrabromphenolphthalein. Unfortunately the intravenous injection of this salt caused constitutional symptoms in some cases which were often distressing, though such ill effects could as a rule be minimized by very slow injection. The iodine salt was next tried; intravenous injections of this salt, possibly because of its exceptional purity, caused no disagreeable reactions, and, moreover, gave a denser shadow of the gall-bladder than was obtained by means of the bromine preparation. L. R. Whitaker and G. A. Milliken²⁰ also state their preference for the iodine salt. The next logical procedure was to endeavour to obtain similar diagnostic results by oral administration of the dyes. Carman,²¹ in recording results obtained with bromine and iodine compounds respectively, found that oral administration of the latter was almost invariably followed by unpleasant gastro-intestinal disturbances; these were much less often experienced when the bromine salt was used. The shadows of the gall-bladder obtained when

PLATE LXII.
 RADIOLOGY OF THE GALL-BLADDER
 (GRAHAM'S METHOD)



Fig. A.—Two gall-stones, showing opaque periphery and nucleus, the intermediate portion being more translucent. Annular type of shadow.



Fig. B.—Gall-bladder containing a large number of small opaque gall-stones. Cluster type of shadow.

PLATE LXIII.

RADIOLOGY OF THE GALL-BLADDER—continued

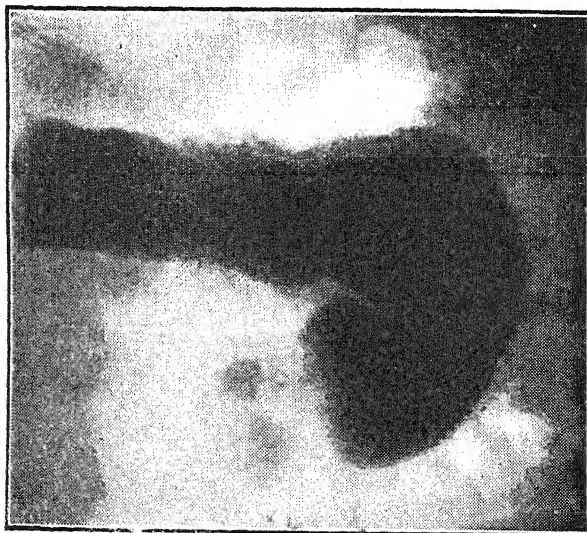


Fig. C.—Collection of many small opaque stones in the fundus of the gall-bladder causing a hemispherical shadow to the outer side of the duodenum. This was an accidental discovery during an opaque meal examination of the stomach and duodenum in the erect position.

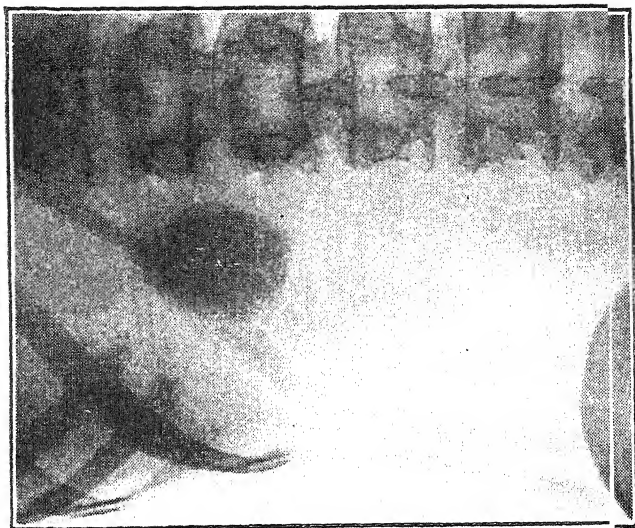


Fig. D.—Normal gall-bladder seen eight hours after intravenous injection of sodium salt of tetrabromophenolphthalein.

R. E. Roberts

PLATE LXIV.

RADIOLOGY OF THE GALL-BLADDER—*continued*

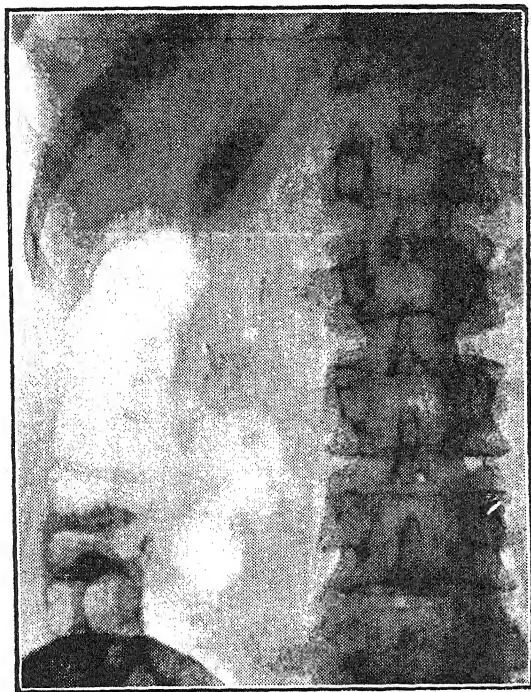


Fig. E.—Same case as *Fig. D* twenty-four hours after injection. Shadow of gall-bladder is smaller but more opaque than in *Fig. D*.

Plates LXII—LXIV, kindly lent by the 'British Medical Journal'

R. E. Roberts

the drug is given orally were not so dense as when injected intravenously. Carman, in concluding, records his preference for the "oral use of the bromine salt, and the iodine salt intravenously to check doubtful cases."

Before the method can come into universal use, especially in non-hospital practice, three essentials must be fulfilled, viz., ease of administration, safety to the patient, and uniformity or accuracy of results. The first essential is fulfilled by the oral method, though this has the disadvantage that to a certain extent the shadows are not so dense as in those obtainable when the intravenous route is employed. The safety of the method may become more assured by the use of purer drugs or possibly of new compounds. Accuracy of results is to a large extent a matter of skilful interpretation. Whilst the method is not infallible, it is manifestly far superior to any previously available. As to its radiological applicability, it should be employed only in cases where by direct radiography a negative or inconclusive diagnosis has been obtained. (See also GALL-BLADDER, DISEASES OF.)

THE URINARY SYSTEM.

Kidney.—R. Dresser's²² article on the *metastatic manifestations of hypernephroma in bone*, which is well illustrated, is useful as showing the varying X-ray appearances in a somewhat rare condition. Ten cases are narrated, and radiographs of the disease attacking various bones are interesting. The disease may occur at any age, but is most common between forty and sixty. As these cases frequently come to the radiologist for a presumably purely local manifestation, he should remember the possibilities. From the X-ray point of view the process is practically always a purely destructive one, but in cases in which there has been a pathological fracture, if healing—which is quite possible—is taking place, then the formation of callus may add to the X-ray diagnostic difficulties.

Bladder.—As illustrating the value of injecting the bladder with a 20 per cent solution of sodium bromide, H. B. Scargill²³ reports two cases with accompanying radiographs in each of which a *diverticulum* is beautifully shown. He first radiographed immediately after the injection, then emptied the bladder with a catheter, and took a second radiograph.

Tumours of the Bladder.—G. E. Pfahler²⁴ has resuscitated the method of examination of the bladder by the injection of air, and has applied it for the purpose of the demonstration of tumours by means of X rays, and also for other conditions. Some interesting radiographs help to emphasize the usefulness of this method. The author claims that the proceeding is harmless, and is useful most especially in cases where a cystoscopic examination is impossible or impracticable.

The Urethra.—E. H. P. Cave and G. L. S. Kohnstam²⁵ draw attention to the fact that the radiography of the male urethra has received practically no attention in England. In this paper the various substances which can be used are compared, and the authors state that undoubtedly lipiodol is the most satisfactory medium. Full details of technique are included.

SPINAL CORD.

J. Berberich and S. Hirsch²⁶ have examined a number of cases in the following manner: Lumbar puncture, and the withdrawal of 5 to 10 c.c. of cerebrospinal fluid, is followed by an injection of 4 to 6 cm. iodipin solution (Merck). The patient is kept on his side, and the pelvis raised for some time, the result being that the iodipin gravitates within the spinal dura mater and the whole extent of the cord is indicated in the radiograph. In a modification of this method they have also injected first 2 c.c. of iodipin, and 15 to 30 c.c. of air,

and then the rest of the iodipin. They claim to have diagnosed meningeal tumours, carious bone invasions, localized meningitis, etc., and with no ill effects, in twenty cases. (*Plate LXV.*) (*See also SPINE; and INTRODUCTION.*)

FALLOPIAN TUBES.

E. Williams and Russell Reynolds²⁷ describe a method for the X-ray investigation of the Fallopian tubes in certain cases of sterility in order to ascertain their patency. By means of very simple apparatus an emulsion of barium sulphate is dropped into the uterine cavity: no pressure is used, and an anæsthetic is not necessary. If the tubes are patent, then the emulsion passes up, and experiments on animals appeared to show that a mechanical factor—*aspiration*—is more probably the cause of this than anything in the nature of ciliary activity. Within seventy-two hours the whole of the emulsion disappears, and in no instances have any after-effects been complained of by the patients.

ADENOIDS.

A new field for radiography appears to have been found by C. C. Grandy.²⁸ In lateral views of the head and neck the nasopharyngeal area is shown as a space: the size of this space can easily be measured, and, if pictures taken before and after operation are compared, the increase in size of the air-passage is obvious. Under certain circumstances the shadows of adenoids are easily demonstrated in this space, and the proof that they are the cause of the shadows is the disappearance of the latter following the removal of the adenoids. The author also suggests that the X-ray examination is useful as a check on the operator in regard to the thoroughness of his operative procedures.

BONES.

Study of Skeletal Remains.—H. J. Means²⁹ reports the results of his radiological investigation of the skeletal remains found in the earthworks of Ohio. These remains are those of a race which has entirely disappeared, a prehistoric people belonging to the stone age in development who lived in the country between the Ohio and Mississippi rivers centuries before the first white man set his foot on American soil; and the Indian tribes entered this country at a much later date. The X-ray investigation was undertaken to determine if an extinct race, apparently having had no contact with later tribes and the white race, would show the same pathological conditions as are found to-day. This paper is of great interest. Many bone radiographs are reproduced, and these show, in addition to injuries, evidence of various diseases, such as Pott's disease, arthritis of the spine, coxa vara, and syphilis. The X-ray evidence of the presence of syphilis amongst these people is conclusive, and significant in view of the belief that it was only introduced into Europe in 1494.

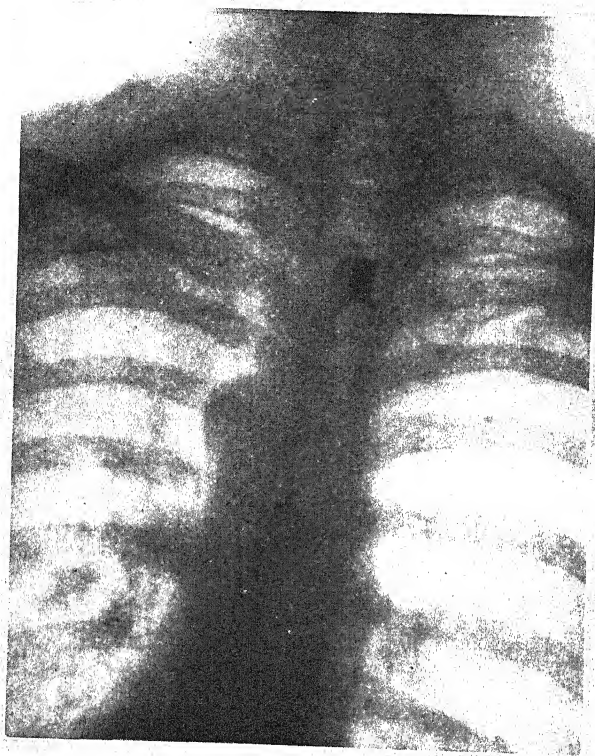
The Skull.—L. T. LeWald³⁰ draws attention, in a paper entitled "Dilatation of Diploic Vein and other Anatomical Variations in the Skull," to the ease with which mistakes in X-ray diagnosis may be made. He illustrates the radiographic appearances of these large diploic channels, and of other conditions which were not necessarily pathological. There is no doubt that the use of the Potter-Bucky diaphragm, etc., has so improved results in skull work that it has become necessary to revise our readings of these radiographs in view of the fineness of the bone detail which can now so easily be shown.

Spine.—In writing on the lateral position in the examination of the lumbosacral region of the spine, LeWald³¹ points out that, with the modern methods now at our disposal, it is sometimes easier to get better lateral than antero-posterior views of the region. The author is chiefly concerned with the

PLATE LXV.

LIPIODOL RADIOGRAPHY OF THE SPINAL CANAL

(C. THURSTAN HOLLAND)

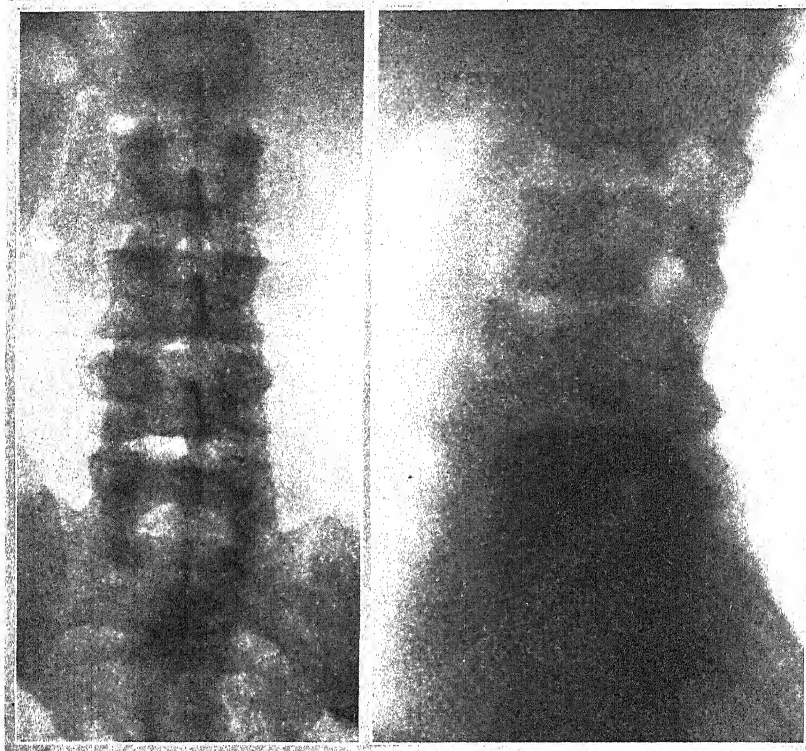


Lipiodol arrested by tumour pressing on cord.

PLATE LXVI.

RADIOGRAPHY OF THE SPINE

(J. H. MATHER)



Anteroposterior and lateral views of the lumbar spine of a patient who fell 30 feet from a broken plank. He complained of pain at the bottom of the back and hips when walking.

lumbosacral angle and the question of lumbosacral dislocation, a condition which can never be diagnosed from an anteroposterior view alone. [Experience of the last few years—that is, since the Potter-Bucky diaphragm, etc., have made it so easy to obtain good lateral views of practically any region of the spine—has emphasized the point that these generally are more reliable, and from the point of view of diagnosis more important, than the anteroposterior views. It is quite certain that gross injuries to the spine may show so little in the anteroposterior view that they might even be entirely overlooked, and yet a side view discloses the state of affairs at once (*Plate LXXVI*). The same sometimes applies to disease.—C. T. H.].

Pseudocoxalgia.—In a well-illustrated paper on this condition, G. Perkins³² deals with the question of the etiology, and gives his reasons for disagreeing with the congenital theory, more particularly that postulated by Jansen. This paper, together with an illustrated reply by Jansen, is of interest, inasmuch as both appear to be quite unconvincing as explaining satisfactorily the curious X-ray appearances which occur.

A further paper on the same subject by T. P. Noble³³ deals with the whole subject, historically, anatomically, and clinically. Comparisons with other diseases are made, the pathology is discussed, and finally causation and etiology are reviewed. The author concludes that trauma is undoubtedly instrumental in the causation of the disease, which passes through several definite phases and tends towards a spontaneous cure.

Cervical Ribs in Children.—A. H. Southam and W. J. S. Bythell's³⁴ paper on this subject is full of interesting information of special value to radiologists. The chief points made are that these ribs are more common in children than has hitherto been recognized; that they rarely produce symptoms which lead to their diagnosis; that they are smaller and more rudimentary in the child, and only develop and ossify following puberty; that their presence may lead to a diagnosis of spinal caries or torticollis; that they are much more common in girls than in boys; finally, that the diagnosis is usually made only after an X-ray examination. [We can fully confirm the frequency with which these ribs are found in children, especially the type which is shown by radiography as fused with a cervical transverse process, and as a rule the X-ray discovery is an accidental one.—C. T. H.]

Osteochondritis of Spine.—J. Calvé³⁵ reports two cases of a curious condition of one vertebra, both occurring in children and both being considered as, and treated for, Pott's disease. On examination of the radiograph before and after cure, it became evident that the condition shown did not fit in with the diagnosis made. One vertebra only was attacked, the intervertebral discs above and below were unaffected, the cartilage was thicker and with no destruction, and the bone density was increased. With this evidence, tuberculosis tests were made under such conditions that all possibility of a mistake was eliminated in both cases: the tests were negative. The Wassermann test was also negative. The author concludes that the affection described is to the spinal column what coxa plana is to the hip, and what Köhler's disease is to the foot.

Acute Osteomyelitis.—F. W. O'Brien's paper³⁶ sums up our knowledge of this subject. The chief point is that the early stages of the disease do not give rise to anything abnormal on the X-ray film, and that an osteomyelitis has usually passed from the acute stage before X-ray bone changes are visible. The author considers that six days at least must elapse from the acute onset before their X-ray signs can be found, and this negative X-ray evidence, inasmuch as it excludes other things, is in itself a valuable diagnostic point in a suspected case.

Tumours of the Jaw.—A paper by G. B. New and F. A. Figi²⁷ on the value of an X-ray examination in the diagnosis of tumours of the jaw is illustrated by good radiographs of somewhat rare conditions. The differential diagnosis is discussed and the difficulties are pointed out. Whilst X rays may be definitely diagnostic, it may not be possible in all cases, even with a consideration of the clinical history, to determine whether a condition found is inflammatory, benign, or malignant.

Multiple Myeloma.—A case of this comparatively rare disease is reported by W. W. Belden,²⁸ and some fine radiographs demonstrate the lesions in the skull, pelvis, and some of the long bones. These lesions are multiple, and the bones are pierced by small focal spots of destruction which are not confluent. The tumours do not expand or destroy the cortex. Pathological fractures, which unite again, are frequent. If Bence-Jones bodies are found in the urine, then a correct diagnosis can be made. It is interesting to note that in the case reported the patient was alive three years after the onset of her first symptom.

Epiphyses.—H. A. T. Fairbank,²⁹ writing on affections of the epiphyses, describes and pictures some of the rarer conditions such as a partial separation of the great trochanter, the separation of a left anterior inferior iliac spine, and the appearance of a separate centre of ossification for the internal malleolus. This latter condition is rare, but the author has seen 5 cases, of which 3 were bilateral and 2 unilateral. There is a lot of valuable information for radiologists in this paper.

Osteochondropathy.—A. Renander³⁰ reports two cases of typical osteochondropathy of the medial sesamoid bone of the first metatarsal, a condition hitherto undescribed. The radiographs illustrating the paper show a deformed sesamoid considerably flattened in the dorso-plantar direction, and also slightly from side to side. The outlines of the bone are notched in fine waves and uneven. The normal bone structure is replaced by spots of increased density, and in the dorso-plantar view the bone appears to be divided into three unequal fragments. In one case the bone was removed and examined. Pathologically and clinically the author considers these cases belong to the group of osteochondropathies associated with the names of Köhler, Legg, Schlatter, etc.

The Carpal Scaphoid.—In writing upon this bone, K. Speed³¹ says that in the wrist the scaphoid is the bone of contention. This paper deals fully with fracture of this bone, and is profusely illustrated, and various types of fracture are shown. Radiographically the author points out that, after such an injury, as months pass, the plane of fracture widens and becomes more apparent; lighter spots of lessened density resulting from bone absorption begin to show after a year or two; the process of slowly extending osseous death, bone absorption, and fibrous replacement goes on year after year. [This fracture is important radiographically and is comparatively common. Accurate diagnosis is necessary, owing to the questions of return to work and compensation. The difficulty of X-ray diagnosis is mixed up with that of ossification from two centres and development in two pieces which are not united by bone. Comparison with the bone of the other wrist may aid in diagnosis, as it would be very rare to have the bone in each wrist fractured, and this comparison should always be made. On the other hand, this development from two centres must be extremely rare. Quain says it occurs, whilst other authorities do not mention it. In a practice of over thirty years and with the advantage of a long experience at a children's hospital, I have never yet seen in a child this bone developing from two centres; it would seem therefore that when in an adult this bone is radiographically in two separate parts, the great probability is that a fracture at some time or other has occurred.—C. T. H.].

Tumours of the Patella.—These tumours (primary) are very rare, and W. H. Cole,⁴² after noting the 24 definite cases so far recorded, adds one of his own which appeared to be a benign cyst of the patella. The X-ray appearances are shown. This is the first case of such a condition to be reported. Radiologists should be aware of the occasional occurrence of primary tumours of this bone, in which all the common bone tumours have been found except myxoma.

LIPIODOL.

L. Reverchon and G. Worms⁴³ have used this substance with great success in the exploration of the cavities of the face and neck. It is possible to obtain good radiographs of the Eustachian tube after the injection of lipiodol through the pharyngeal orifice, and the technique is described. These authors also use this substance in dental cysts, and consider it preferable to barium or bismuth in connection with the radiography of the œsophagus. They also consider it of considerable value in the exploration of the trachea for foreign bodies and tumours.

MARKING PLATES.

R. B. Taft⁴⁴ has an ingenious new method for marking plates at the time of taking the radiograph. He adds about 25 per cent of standard mucilage acacie to ordinary writing ink. With a heavy pen he writes on paper, say, the name of the patient, the serial number, and the date; before the ink has time to dry, powdered metallic lead (fine filings) is sprinkled on and the excess shaken off; this renders the ink opaque to X rays. The slip of writing is placed on the edge of the plate-carrier, and the writing shows on the plate when it is developed. [This method should be of value in medico-legal cases as proving the plate beyond all doubt; in these cases it would be of additional value to add the signature of the radiologist.—C. T. H.]

REFERENCES.—¹*Brit. Med. Jour.* 1925, ii, 47; ²*Brit. Jour. Radiol.* 1925, i, 48; ³*Ibid.* 1; ⁴*Proc. Roy. Soc. Med.* (Elect.-therap. Sect.), 1925, 9; ⁵*Amer. Jour. Roentgenol.* 1924, ii, 444; ⁶*Brit. Med. Jour.* 1925, i, 145; ⁷*Ibid.* i, 151; ⁸*Amer. Jour. Roentgenol.* 1924, ii, 414; ⁹*Jour. Amer. Med. Assoc.* 1924, 1240; ¹⁰*Brit. Med. Jour.* 1924, ii, 615; ¹¹*Proc. Roy. Soc. Med.* (Sect. Dis. of Children), 1924, 17; ¹²*Amer. Jour. Roentgenol.* 1925, i, 529; ¹³*Ibid.* 429; ¹⁴*Ibid.* 1924, ii, 312; ¹⁵*Jour. Amer. Med. Assoc.* 1924, 613; ¹⁶*Ibid.* 1777; ¹⁷*Ann. of Surg.* 1924, Sept.; ¹⁸*Amer. Jour. Roentgenol.* 1924, ii, 403; ¹⁹*Brit. Med. Jour.* 1925, ii, 54; ²⁰*Surg. Gynecol. and Obst.* 1925, 17; ²¹*Lancet*, 1925, ii, 67; ²²*Amer. Jour. Roentgenol.* 1925, i, 342; ²³*Brit. Jour. Radiol.* 1924, ii, 323; ²⁴*Jour. Radiology*, 1924, Sept.; ²⁵*Brit. Jour. Radiol.* 1925, i, 121; ²⁶*Klin. Woch.* 1925, 14, and *Brit. Med. Jour. Epit.* 1925, i, 55; ²⁷*Brit. Med. Jour.* i, 1925, 691; ²⁸*Amer. Jour. Roentgenol.* 1925, ii, 114; ²⁹*Ibid.* i, 359; ³⁰*Ibid.* 1924, ii, 536; ³¹*Ibid.* ii, 362; ³²*Jour. Bone and Joint Surg.* 1925, 13; ³³*Ibid.* 1925, 70; ³⁴*Brit. Med. Jour.* 1924, ii, 844; ³⁵*Jour. Bone and Joint Surg.* 1925, 41; ³⁶*Boston Med. and Surg. Jour.* 1924, 484; ³⁷*Jour. Amer. Med. Assoc.* 1924, 1555; ³⁸*Amer. Jour. Roentgenol.* 1925, i, 442; ³⁹*Proc. Roy. Soc. Med.* (Orthopædic Sect.), 1924, 1; ⁴⁰*Acta Radiol.* 1925, 521; ⁴¹*Jour. Bone and Joint Surg.* 1925, 682; ⁴²*Ibid.* 637; ⁴³*Rev. de Laryngol., d'Otol. et de Rhinol.* 1925, 189, and *Brit. Med. Jour. Epit.* 1925, i, 97; ⁴⁴*Amer. Jour. Roentgenol.* 1924, ii, 390.

X-RAY THERAPY. (See RADIOTHERAPY.)

YELLOW FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further confirmatory work on Noguchi's discoveries on yellow fever has accrued during the past year. Experimental studies in Northern Brazil by H. Noguchi and others,¹ forming a commission of Rockefeller and Brazil workers, resulted in the isolation of two strains of *Leptospira icteroides* in an investigation of 9 cases several days' journey from Bahia, which produced the characteristic disease in guinea-pigs, increasing in virulence on passage through several animals, as well as in monkeys and dogs. The

filterability of the organism was demonstrated. The serum of 9 recovered cases of yellow fever agglutinated the organisms, and also those obtained from cases in Ecuador, Mexico, and Peru, although control normal sera had no such effect, proving the identity of yellow fever in all those areas; while 0.0001 c.c. of an anti-icteroides serum from previous strains protected guinea-pigs against 1000 minimal lethal doses of the Brazilian strain, leaving no doubt about the specificity of the organisms. Noguchi² also publishes a useful summary of his researches, which have already been dealt with in the MEDICAL ANNUAL. J. Chan³ records the results of the Noguchi treatment and of prophylactic measures in an epidemic in a college with over 100 students at Belsize, British Honduras, with the help of the Rockefeller Institute. The 17 cases occurred in three batches all receiving the Noguchi serum; and 4 untreated until the fourth to the sixth day of the disease died, but the other 13 treated on the first or second day all recovered. Noguchi's prophylactic vaccine was also used, and no cases occurred in Belsize town among the inoculated, including between 100 and 200 susceptible whites, and it is very significant that the only two whites who declined inoculation both contracted yellow fever. Fumigation of the college was carried out piecemeal on the outbreak of the disease, but failed to prevent new cases until all the students were isolated at a distance and the whole buildings efficiently fumigated at one time. T. J. LeBlanc⁴ records a study of 7 cases of yellow fever at Vera Cruz, Mexico, the *Leptospira icteroides* being isolated from a guinea-pig typically infected from one of the cases. Anti-icteroides serum was used in the treatment of all the cases, and only one, in whom it was not commenced until late on the third day, died; the favourable effects were evidenced within a few hours by the fall in temperature and pulse-rate and improved general condition. A prophylactic vaccine of dead cultures of the *L. icteroides* was used extensively, and only two mild cases of yellow fever developed among 748 non-immune vaccinated persons; but 199 cases developed among unvaccinated non-immunes, who were not numerous, although their exact number is not known, so the disease is believed to have been considerably reduced by this measure.

H. R. Muller⁵ describes the microscopical changes found in young guinea-pigs, puppies, and a monkey experimentally infected with yellow fever, which were similar to those of human yellow fever: fatty degeneration of the liver and kidneys was well marked, while persistent moderate leucopenia was the rule, but the red corpuscles and hæmoglobin showed little change, again as in the human disease. W. H. Hoffmann⁶ found very similar changes in old preserved material from Habana cases, but also describes lime casts in the kidneys, which he thinks is of diagnostic value, and suggests that they might be found in the urine during life in yellow fever. The same writer⁷ discusses the debatable question whether there is yellow fever in Africa, and points out that this has never been proved by modern methods of investigation, while hæmoglobinuric and blackwater fevers may easily be confused with yellow fever.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1924, Sept. 13, 820; ²*Jour. Trop. Med. and Hyg.* 1925, May 15, 185; ³*Ibid.* Jan. 15, 26; ⁴*Ibid.* May 1, 169; ⁵*Ibid.* 1924, Nov. 15, 299; ⁶*Ibid.* Sept. 1, 235; ⁷*Ibid.* July 15, 199.

Miscellaneous.

THE EDITORS' TABLE.

Samples (not returnable) and particulars for this section should be sent to The Editors, 'Medical Annual' Offices, Stonebridge, Bristol, not later than NOVEMBER 1.

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the MEDICAL ANNUAL has come to be valued.

NEW PHARMACEUTICAL PRODUCTS AND DIETETIC ARTICLES.

We are always ready, when a sufficient quantity is sent to us EARLY IN THE YEAR, to arrange for these to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

NEW MEDICAL AND SURGICAL INSTRUMENTS AND APPLIANCES.

We give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves, subject only to the following conditions—

1. Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a SEPARATE sheet or sheets of paper. This should have attached to it any illustration (WHICH MUST BE SMALL) for which insertion is desired, and also bear the maker's name. The attention of firms who send a large number of articles for notice is particularly directed to the above conditions, as each article has to be sorted into its proper department before it can be considered.

2. Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.

The Editors are not able to accept reference to circulars, catalogues, or literature as a compliance with these conditions.

PROGRESS OF PHARMACY, DIETETICS, Etc.

Agomensin and Sistomensin.—In the *Journal of Obstetrics and Gynaecology of the British Empire* (Winter Number, 1924), there is a reference to the important work of Seitz in connection with the possibility of a double set of secretory cells in the corpus luteum. Seitz claimed to have isolated from cow corpora lutea two active principles: (1) Lipamin, or agomensin, found in the early stages, which injected subcutaneously produces the menses in amenorrhœic women; (2) Luteo-lipoid, or sistomensin, which is found in older corpora lutea and which acts as an inhibitor of the menstrual function. Agomensin and sistomensin have been available for some time in tablet form, and many authorities have spoken highly of this form of medication. Schil (*Le Progrès Médical*, 1924, No. 41) has frequently, in hospital practice, administered these substances subcutaneously, and, in the article referred to, records his results very fully. It is possible that the protein and lipid molecules of these substances are affected by the action of the digestive juices when given by the mouth, but such an effect is entirely avoided when the hypodermic method is employed. It is interesting to note that Schil's experience was that if treatment was started with the hypodermic method it could be continued with success by oral administration. Lipamin (agomensin) has given some notable successes in cases of retarded development, amenorrhœa, disturbances associated with the menopause, etc., while the use of luteo-lipoid (sistomensin) is indicated in dysmenorrhœa, menorrhagia, etc. (The Clayton Aniline Co. Ltd., 40, Southwark Street, S.E.1.)

Antiphlogistine.—The Denver Chemical Manufacturing Co. send us a copy of the report we wrote of antiphlogistine in 1903, when the value of the preparation was little known in this country, and ask whether, after a quarter of a century, the good opinion we then formed of it has changed. It does not occur to them that while their preparation continues unchanged, the writer of these reports might have gone West long ago. But we are thankful to say that it is not so. We remember writing the report and regarding antiphlogistine as a great addition to our resources and one that we should be sorry to be without, and after many years' experience we are confirmed in this view.

Antivirus.—This is the name given by Besredka to certain substances present in broth culture in which bacteria have been grown. These substances possess specific immunizing and bactericidal properties, and, when employed intradermally or locally, they confer local immunity against the causative organisms. Antivirus is a sterile non-toxic fluid, quite distinct from a serum or vaccine. It possesses no general immunizing property, but exercises its effect directly on the part to which it is applied. It is, therefore, useless in generalized infections or in deep-seated local infections unless the locus is first exposed to its action by surgical measures. The field of utility of antivirus covers all infections to which local application can be made, such as infections of the skin, genito-urinary passages, and mouth, nose, and throat. A bacteriological examination is first necessary, and then a stock antivirus used until an autogenous one can be prepared. (Allen & Hanburys Ltd., Vere Street, W.I.)

Bismuth Metal.—'Hypoloid' bismuth metal in isotonic glucose solution (0.2 grm. in 1 c.c.) is prepared by Burroughs Wellcome & Co. for the treatment of syphilis. It presents metallic bismuth—now recognized as a definite spirillicide—in the form best suited for intramuscular injection, and removes several objections which have militated against the use of some other bismuth preparations. The isotonic glucose solution allows uniform absorption to take place, and practically eliminates abscess formation if the usual technique for intramuscular injection is observed. It is supplied in rubber-capped bottles of 5 c.c. and 10 c.c., and the commencing dose suggested is 1 c.c. at each injection.

Bismuth Salicylate Ampoules.—Each ampoule contains 2 gr. of chemically pure bismuth salicylate, in very fine powder, suspended in olive oil, to which is added 10 per cent of camphor and of creosote to minimize irritation or pain at the site of injection. This preparation is injected intramuscularly in the treatment of syphilis (all stages) in adults or children. The average dose is 1 c.c., and from 12 to 15 injections constitute one course of treatment. The ampoules contain 1 c.c. of the suspension, and are supplied in boxes of 6 or 12. (Parke, Davis & Co., London.)

Cascara Gratus.—Cascara sagrada is without doubt a most valuable aperient, but unfortunately it is also one of the most unpleasant to take. Many attempts have been made to free the active principle from the nauseating one with which it is associated. This has now been successfully done by R. Sumner & Co. Ltd., of Liverpool, who manufacture a concentrated preparation of cascara, representing the entire therapeutic value of the bark and yet absolutely free from the taste of cascara. Price 6s. 6d. per lb.

Cibalumin.—The action of subcutaneous, intramuscular, or intravenous injections of a protein manifests itself by local reactions, which are characterized by a stimulation of the nervous heat-centres, by an increased activity of the immunizing system of defence, and by the production of focal reactions in the domain of chronic inflammatory processes and similar disorders of metabolism. Various protein substances have been employed in non-specific protein therapy; but it is, of course, important to have a uniform and permanent preparation of exact dosage to provoke that therapeutic shock which is so often of considerable importance for therapeutic and diagnostic purposes. Cibalumin represents an aqueous and limpid solution of egg-albumen which is aseptic and free from ferments and undesirable salts. The hypodermic, intramuscular, or intravenous injections of even large therapeutic doses have always been well tolerated. Symptoms of anaphylaxis or collapse have never been observed after the administration of doses appropriate to the case under treatment. Consequently cibalumin would appear to be an ideal preparation for use in non-specific protein therapy. (The Clayton Aniline Co. Ltd.)

Cibalgin.—This is a new combination of amidopyrin with a small dose of dial, introduced at the request of many physicians, and it should fill a long-felt want. It is primarily intended as a non-narcotic analgesic. Extensive pharmacological and clinical tests have confirmed the value of this compound, the exhibition of which is characterized by the rapidity of action in relieving pain, irrespective of the underlying cause, and by the intensity and duration of its analgesic and calming effects, which are produced without any risk of overstepping the therapeutic dose of its components. The exhibition of cibalgin does not induce any secondary phenomena or habit, and consequently it may well replace morphine. This new compound is available in the form of tablets and liquid for oral use, while ampoules are available for hypodermic injections, which are entirely painless. The liquid should be particularly useful in those cases that require individual or graduated dosage, e.g., in paediatrics. (The Clayton Aniline Co. Ltd.)

Cod-liver Oil Tablets ('Moruette').—These tablets present the extractive, without the concomitant fat and fatty acids, in a palatable and easily assimilated form. Bulk for bulk, the vitamin content is over one hundred times as much as that of such fats as butter, etc.; hence its value in wasting diseases, cases of malnutrition, etc. In the refining of certain grades of the oil, the heat employed has a most destructive action on some of the vitamin and cholesterol content, these bodies being markedly susceptible to high temperature. In the manufacture of the extractive this danger is carefully guarded against, and each factor is retained in a perfect state of therapeutic efficacy. These tablets may be used in all cases where cod-liver oil is indicated, and a large number of patients will be able to take them who would reject the oil. They are worthy of a careful clinical trial. (Arthur H. Cox & Co. Ltd., Brighton.)

Codliver.—This is a confection containing the lipid of the liver in such a proportion that one tablet is regarded as equivalent to one tablespoonful of cod-liver oil. Iscovesco, in 1914, isolated a lipid of the cod's liver to which he attributed all the medicinal properties of the oil. Codliver, manufactured by John Bell & Croyden Ltd., rather justifies this view by the favourable results obtained from it, and being quite palatable is much appreciated. (John Bell & Croyden Ltd., Laurence Road, Tottenham, N.15., and 50-52, Wigmore Street. W.1.)

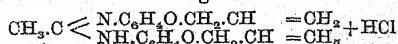
Coramine.—This is the trade name for pyridine-b-carbonic acid diethylamide, which was the subject of an article by Professor E. Stanton Faust, published in *The Lancet*, June 27, 1925. This new synthetic chemical is of quite exceptional interest, as it possesses a distinctive camphor-like action. It is well known that for many years attempts have been made in the laboratory to produce a water-soluble form of camphor, but the various derivatives so far have not been proved to possess the typical therapeutic properties associated with camphor. Professor Faust has demonstrated that the action of coramine is almost identical with that of camphor, and, indeed, he claims that it is superior to the latter, especially as regards its action on the heart and in counteracting the effect of morphine. He also shows that in small doses it exhibits an effect similar to that of digitalis, while its stimulating effect extends to both the motor and sensory nervous system. Coramine, which would appear to be indicated in all cases characterized by shock, heart asthenia following infectious diseases, arteriosclerosis, renal affections, bronchial asthma, emphysema, poisoning through narcotics, asphyxia of the new-born, etc., is available in the form of liquid for oral use and in ampoules for parenteral administration. (The Clayton Aniline Co. Ltd.)

Dial.—The hypnotic-sedative properties of dial (diallylbarbituric acid) and its derivatives are so well known to members of the medical profession that it is scarcely necessary to refer to them. Up to now dial has been available in tablet form only, but dial liquid compound, each c.c. containing $1\frac{1}{2}$ gr. of dial, for oral use, and ampoules, each containing 3 gr. of dial, for hypodermic use, are now available. (The Clayton Aniline Co. Ltd.)

'Digifortis'.—This preparation is a physiologically standardized fat-free tincture of digitalis prepared from the finest leaves obtainable, with every precaution to ensure an exceptionally reliable and active product, which is 50 per cent more effective than the B.P. tincture. The average dose is 8 min. (0.5 c.c.) two or three times daily (or more often if indicated). Digifortis is supplied in 1-oz. amber glass bottles, from which air is excluded, so that deterioration from atmospheric influences is avoided. (Parke, Davis & Co., London.)

Digitalis Leaf.—Burroughs Wellcome & Co. have placed a 1-gr. tabloid of digitalis leaf on the market. The cultivation of digitalis at the 'Wellcome' Materia Medica Farm at Dartford, Kent, has enabled the firm to gather exceptional experience in the conditions necessary for obtaining reliable material for medicinal use. 'Tabloid' digitalis leaf gr. 1 is issued in bottles of 25 and 100.

Diocaine.—Diocaine is known as para-diallyl-oxyethyl-diphenyl-diamidine or '89G'. It consists of colourless powder melting at between 152° and 153° C., and it is soluble in water and alcohol. It has the following formula:—



It is particularly useful as a local anæsthetic in ophthalmology. Lussi (*Schweiz. med. Woch.* 1924, No. 25) states that a 2:1000 solution can be used in eye work. Diocaine does not affect blood-vessels, intra-ocular pressure, the pupil, or accommodation. Aqueous solutions are neutral in reaction, may be sterilized by boiling, and are permanent. Instillations are found to be painless and non-irritant, while

the anaesthesia produced when diocaine solution is instilled into the eye sets in rapidly and is lasting. One drop of a 2:1000 solution suppresses the corneal reflex for about 15 minutes. Diocaine substance is available in vials containing 0.5 grm. (The Clayton Aniline Co. Ltd.)

Endogens (Liquid).—We mentioned in our last edition that Sumner & Co. Ltd., of Liverpool, were producing endogens in liquid form, which increases their activity and greatly reduces the cost of prescribing. They have published a little book giving full particulars of the various combinations and their therapeutic application. They will be glad to supply it to any of our readers who are interested in this branch of therapy.

'Ethidol'.—'Ethidol' (ethyl iodo-ricinoleate) is prepared by Burroughs Wellcome & Co. as an outcome of the successful internal use of 'Iodidin', a calcium salt of iodo-ricinoleic acid. In 'ethidol' the calcium base is replaced by the ethyl radical, and the result is a product, presenting 20 per cent of iodine in organic combination, suitable for intraglandular injection or inunction. As an injection it has been employed in epilepsy, rheumatoid arthritis, and in the treatment of tuberculous and scrofulous glands. As an inunction successful clinical results have followed its use in simple goitre and rheumatoid arthritis, and, in view of its iodine content, its further trial is suggested in sprains, neuritis, and some skin affections such as eczema, psoriasis, ringworm, and erysipelas. 'Ethidol' does not stain or cause local irritation. It may be heated to 100° C. for sterilization before injection. Injections are stated not to cause induration and are usually painless. Should reduction in strength be considered desirable, it is miscible with almond oil, olive oil, 'paroleine', or 'borofax'. 'Ethidol' is issued in bottles of 1 cz. and 4 oz.

Hexamine and Methylene Blue.—This is a combination of 3 gr. hexamine with $\frac{1}{2}$ gr. methylene blue. The therapeutic activity of hexamine is enhanced by the addition of methylene blue, which possesses analgesic as well as antiseptic properties and is equally active in acid or alkaline urine. The combined product should be of value in a variety of biliary and genito-urinary conditions, before and after operations on the kidneys and prostate, and in pyelitis, urethritis, and septic urinary conditions. Issued in bottles of 25 and 100, by Burroughs Wellcome & Co. Ltd.

Hypertherman.—This preparation unites in itself the activating and modifying effect of the milk-protein bodies with the action of an exactly dosed strain of a saprophytic coli bacillus cultivated from milk. It is said to sensitize the body to small doses of thyroid gland, and is used in cases of obesity. (H. R. Napp Ltd., Clements Inn, W.C.2.)

Infant and Invalid Foods.—Montgomerie & Co. Ltd., Ibrox, Glasgow, send us 'Berina' Infant Food and also 'Berina' Malted Milk. Both are of a high standard of quality and quite palatable. These foods have only been recently placed on the market, but they have already been adopted by several large hospitals in Scotland, especially for the treatment of children, and the health and weight charts of the cases have been most satisfactory. The 'Berina' Malted Milk is a remarkably good food for invalids, and is an agreeable change from other invalid foods.

'Dorsella' Milk Food.—We have also received from Prideaux's Pure Casein and Life Food Co. Ltd., Motcombe, Dorset, a sample of their pure dried 'Dorsella' Milk Food.

The claims put forward for this food, that it is free from bacteria, that the albumin is unchanged, and that the vitamins are preserved, are well supported by very careful laboratory researches. When diluted with water it has all the nutritive properties of a full-cream milk, and has the advantage of being absolutely pure. It is valuable not only for infants but in all conditions when a readily assimilated extra nourishment is indicated. The profession can recommend it with every confidence.

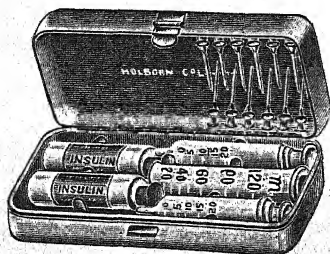


Fig. 57.

Insulin Outfit.—This outfit (Fig. 57) is designed for the use of patients when travelling. A small glass measure is provided which is held upright when in use by a clip in the case. Alcohol is carried in a screwed-down case containing a stopper with alcohol, and the dose of insulin is drawn through the rubber cap on the tube. (The Holborn Surgical Instrument Co. Ltd.)

Intestinal Streptococcus Vaccine.—This vaccine is prepared in the Department for Therapeutic Inoculation, St. Mary's Hospital, Paddington, from a large number of different strains of streptococci from the faeces of patients suffering from various forms of intestinal toxæmia. It is employed in cases of intestinal toxæmia attributable to streptococci rather than to coliform bacilli. It is also of service in very small doses in cases of asthma due to protein sensitization arising from streptococcal infection of the intestine. The vaccine is issued in four dilutions, containing respectively 2, 10, 50, and 500 million streptococci per c.c., by the sole agents, Parke, Davis & Co., London.

Iodine Pastilles ('Collosol').—During the past year we have used the Crookes collosol iodine pastilles in a number of cases of chronic pharyngitis and other throat affections. The clinical result has been excellent, and they are much appreciated by the patients, as they are pleasant to take. Collosol iodine may be also used for the same affections in an aqueous form, but we prefer the pastilles. (The British Colloids Ltd., 22, Chenies Street, W.C.1.)

'Isacen' is a white, tasteless and odourless powder, insoluble in water and acids, and therefore passing through the stomach and small intestines (which in 90 per cent of cases of constipation have nothing to do with the cause) without undergoing any change. Under the influence of the alkaline secretions of the large intestines, 'isacen' gradually liberates dihydroxyphenyl-isatine, thereby enabling this substance to exert its action solely and selectively at the actual seat of the trouble, i.e., the mucous lining of the colon; stimulating peristalsis, but itself passing on unchanged and being eliminated with the stools. It is non-toxic, and, unlike vegetable purgatives, acts in very small doses, liberating its active principle only in an alkaline medium. It is supplied in granules containing $\frac{1}{4}$ gr., and 2 to 4 of these are usually a sufficient dose. (The Hoffmann-La Roche Chemical Works Ltd., 7 and 8, Idol Lane, E.C.3.)

Normosal.—This is a sterile serum salt. It corresponds to the ionic analysis of the human blood serum. Besides chloride of sodium, which is essential for sustaining osmotic pressure in the tissues, it contains potassium and calcium and bicarbonate and acid phosphate of sodium. The last two ingredients are of physico-chemical importance, as they maintain the degree of chemical alkalescence of the blood. It is supplied in ampoules, 1 gm. = 100 c.c. of solution, by H. R. Napp Ltd., Clements Inn, W.C.2.

'Olgar.'—This preparation consists of highly purified liquid paraffin emulsified with agar. It has the appearance and consistence of cream, and is agreeably flavoured. The paraffin is rigorously tested to ensure freedom from injurious by-products and the right degree of viscosity for intestinal lubrication. Administered in this combination the paraffin is not so liable to leak from the rectum as plain oil will sometimes do. The administration of 'olgar' is indicated in cases of chronic faecal stasis, catarrhal conditions of the intestine, hæmorrhoids, etc. The dose for an adult is 1 tablespoonful night and morning. It is supplied in 16-oz. bottles by Parke, Davis & Co., London.

Otalgan.—This is a 5 per cent solution in glycerin of phenyl-dimethyl pyrazolon. It is used for the treatment of otitis media, inflammation of the tympanum and tympanic membrane, and complications of the ear arising from coryza, influenza, and other infectious diseases. It is dropped into the ear, and its effects are largely due to osmosis. (H. R. Napp Ltd., Clements Inn, W.C.2.)

Pax.—This is stated to be a harmless and most efficacious remedy for sea-sickness. R. Sumner & Co. Ltd., of Liverpool, vouch for this fact, but they do not give any particulars of its composition. It is sold in boxes of twelve doses at 3s. 6d.

Pheno-barbital Elixir Sodium.—Pheno-barbital is recognized as a safe hypnotic, and is very extensively used. Recently a soluble sodium salt was isolated, thus enabling the preparation to be administered in liquid form. Owing to the fact that the taste of pheno-barbital is unpleasant, some skill is required to produce a preparation that is not nauseous. R. Sumner & Co. Ltd., of Liverpool, have succeeded in doing so, and have produced an elixir which is a most useful method of prescribing it. Price 7s. 6d. per lb.

Pituitary Extract.—Boots Pure Drug Co. Ltd., Nottingham, are now preparing pituitary extract at their own laboratories from carefully selected glands. It is standardized and has high efficiency, and may be used with every confidence.

Scarlet Fever Streptococcus Antitoxin.—This serum product is highly concentrated, low in protein content, high in antitoxic and antibacterial value, and is believed to be definitely superior to any serum heretofore available for the treatment of scarlet fever. It is claimed to be of great value, also, as a prophylactic. This serum is unusually high in antitoxin strength—1 c.c. will neutralize more than 35,000 skin test doses of standard scarlet fever streptococcus toxin—and as it is also actively antibacterial, it exerts a direct action on the infectious process in addition to neutralizing the toxin. It is supplied in bulbs containing 10 c.c. by Parke, Davis & Co., London.

Sea Cones.—These are suppositories which, when used night and morning, are claimed to prevent sea-sickness. Two suppositories contain 15 gr. of chloral and 30 gr. of bromide. This treatment has been used with success by Dr. Vincent Moxey, and the cones are prepared by Allen & Hanburys Ltd., London.

Sodium Tetrabromphenolphthalein.—Recent investigations have confirmed the value of this product for X-ray examination of the gall-bladder. This substance is excreted through the gall-bladder, and during its passage will produce a shadow on the X-ray plate, thus serving a similar purpose to that supplied by barium sulphate in the X-ray examination of the stomach and intestines. It is supplied by Allen & Hanburys Ltd., London.

'Somnifaine' is a very powerful sedative and hypnotic. Being soluble in water, it acts in a rapid, uniform, and certain manner. It has no cumulative action, is non-habit-forming, and contains neither opium, morphine, scopalamine, nor any other D.D.A. drug. Given in therapeutic doses it is less toxic than any other barbituric acid preparation. Each c.c. contains 0.1 grm. diethylbarbituric acid and 0.1 grm. allyl-isopropyl-barbituric acid. One of its great advantages is its wide field of application. It can be given with safety to quite young children (2 to 5 drops according to age), to elderly people (20 to 30 drops), and to adults (up to 40 or 60 drops). In certain types of intense agitation, one, two, or three 2-c.c. ampoules may be injected into muscle tissue. By means of intravenous injections of large doses, 'somnifaine' renders painless childbirth attainable, and opens up possibilities for a new and original method of general anaesthesia. The usual dose is 20 to 40 drops in water half an hour before bed-time. Ampoules of 2 c.c. are supplied for intramuscular injection. (The Hoffmann-La Roche Chemical Works Ltd., 7 and 8, Idol Lane, E.C.3.)

Staphylococcus Acne Bacillus Filtrate.—This is prepared by Reynolds & Branson Ltd., of Leeds, and has been used with great success in the treatment of acne and some forms of eczema. We are sure that our readers will find it of great service in cases which are apt to resist ordinary medication. It is used not by subcutaneous injection, but by direct application to the affected part, and is allowed to dry on the skin.

Sugar Test Case.—Burroughs Wellcome & Co. have put up in a small box all the reagents, test tubes, and appliances required for the Benedict test for sugar in the urine. They supply pellets which, when ignited on a piece of asbestos, give a flame sufficient to boil the urine and thus save the necessity of a spirit lamp. The box contains sufficient for 24 tests. Intended primarily for the use of patients having insulin treatment, this outfit would be of real value in the practitioner's bag, as it would be useful to test a specimen of urine for albumin as well as sugar.

Boots Pure Drug Co. Ltd., Nottingham, put up a very similar outfit for the same purpose. By dispensing with bottles for the tablets, they can supply 50 tests in a much smaller case. The case also includes an ingenious rubber plunger for cleaning the test tube after use.

Sulfoxyl Salvarsan.—This is a 5 per cent solution, ready for immediate use, prepared by Meister Lucius & Brünig, and obtainable from A. C. Henry, 19, St. Dunstan's Hill, E.C.3. This relatively non-toxic drug may be given in large doses without causing any reaction. In this respect sulfoxyl-salvarsan possesses a marked superiority over all other salvarsan preparations. It is unsuitable for use in the acute primary and secondary stages of syphilis because of its slow action on the spirochaetes, and because of the fact that it remains in the body for a great length of time, with consequent risk of cumulative effects. In these stages of the disease the more rapidly acting salvarsan preparations retain their importance.

Thiostab.—This is a stable solution of pure sodium thiosulphate prepared by Boots Drug Co. Ltd., Nottingham. It has been used in the treatment of the dermatitis following the use of arsenobenzol compounds, and in the stomatitis due to the administration of bismuth or mercury. Injections are given intravenously.

Tuberculosis, Cutaneous Inoculation for.—The Dr. Ponndorf method is to apply the virus to the skin after scarification. Virus A is used for tuberculosis, and virus B for mixed infections. These are supplied by H. R. Napp Ltd., Clements Inn, W.C.2, who will send a descriptive booklet on application.

Xifal Milk.—This is a combination of sterilized milk with a vaccine of low virulence. It is especially used in the treatment of epilepsy and degenerative diseases of the nervous system. (H. R. Napp Ltd., Clements Inn, W.C.2.)

MEDICAL AND SURGICAL APPLIANCES.

Abdominal Instruments.—Mr. Harold Upcott, of Hull, has designed two instruments of interest to those who perform abdominal operations. The first is a double Towel Clip (*Fig. 58*) which will lie flat upon the abdominal wall, while the second is a Liver Retractor (*Fig. 59*), the curve and shape of which have been most carefully calculated to give a maximum and efficient exposure.

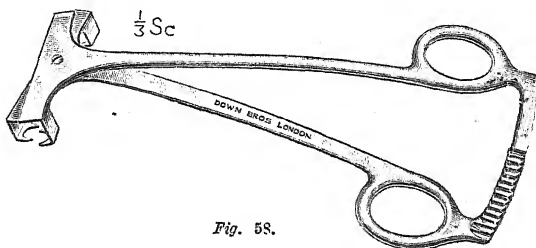


Fig. 58.

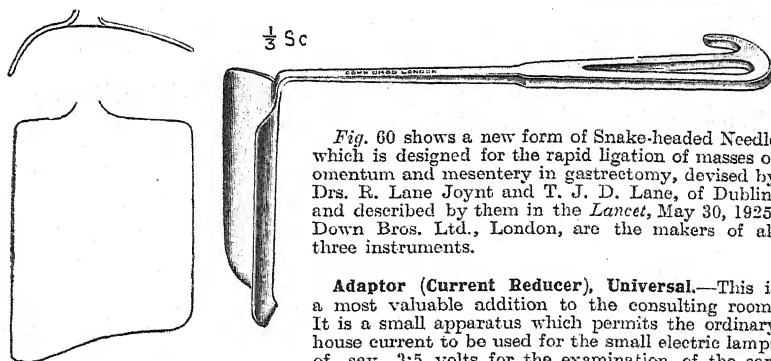


Fig. 59.

Fig. 60 shows a new form of Snake-headed Needle which is designed for the rapid ligation of masses of omentum and mesentery in gastrectomy, devised by Drs. R. Lane Joynt and T. J. D. Lane, of Dublin, and described by them in the *Lancet*, May 30, 1925. Down Bros. Ltd., London, are the makers of all three instruments.

Adaptor (Current Reducer), Universal.—This is a most valuable addition to the consulting room. It is a small apparatus which permits the ordinary house current to be used for the small electric lamps of, say, 3.5 volts for the examination of the ear, throat, and nose. The advantage over dry batteries is obvious: it is only necessary to have a few spare lamps, to be sure that the light will not fail. When ordering, state voltage required. This adaptor is supplied by A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.



Fig. 60.

Aneurysm Needle.—Mr A. Knyvett Gordon has designed a stainless-steel aneurysm needle and dissector (*Fig. 61*) for use in operations for the transfusion of blood where



Fig. 61.

it is desirable that the vessels of the donor or recipient should be handled as delicately as possible. The inventor states that he has found most instruments designed for the purpose unduly heavy. (Down Bros. Ltd., London.)

Aural Syringe (Improved).—This syringe (*Fig. 62*), made to the design of Sir Robert Woods, is entirely without washers, and is capable of being rendered absolutely aseptic. The nozzle is coned, so that the end fits it accurately without any leakage; the screw is

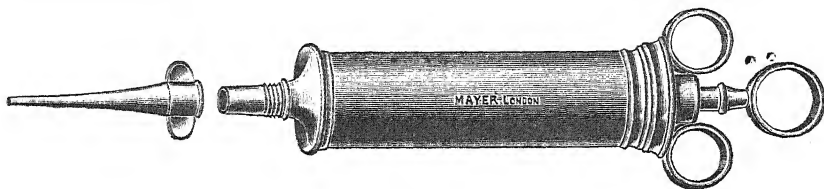


Fig. 62.

rapid, just over one turn fastening it securely. The end of the syringe has a large orifice, so that it fills rapidly, and the syringe has a capacity of 4 oz. (Mayer & Phelps, 59-61, New Cavendish Street, W.1.)

Auriscopes (The Wappler) (*Fig. 63*).—This is a pneumatic and operating instrument. The lamp is fitted with a lens which focuses the light so that a clear and magnified view of the ear-drum is shown. When using the instrument, the lens cap is removed and a small magnifying lens is swung into position. The battery handle is the same as that used with the May's ophthalmoscope. (The Holborn Surgical Instrument Co. Ltd., London.)

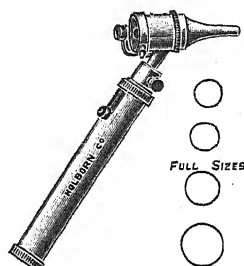


Fig. 63.

Bedstead (Surgical).—The 'Oakdale' Surgical Oscillating Bedstead (*Fig. 64*) is specially designed for institution use. It is fitted with special rigid knee-rest, movable back-rest and foot-rail, and self-raising attachment. The removable foot-rail enables the attendants to place a patient on an 'Oakdale' bedstead after an operation with

perfect ease and security. By simply pulling the cross-bar the mattress can be adjusted to the desired angle, a distinct advantage over the usual method of lifting the bed on blocks and fixing a bolster under the patient's knees. The movable back-rest is easily adjusted to suit the comfort or the position of the patient. The bedstead is strongly built of seamless welded steel tubing throughout, and white enamelled. It possesses many advantages which are obvious, and it will form a valuable addition to any hospital ward in which it may be placed. It is manufactured by Evered & Co. Ltd., Surrey Works, Smethwick, Birmingham.

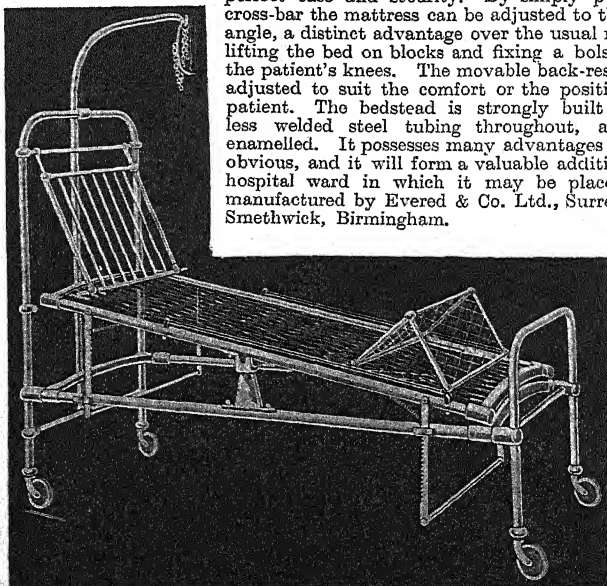
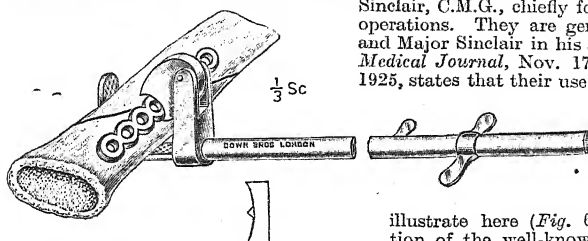


Fig. 64.

Bone Clamp.—The clamp illustrated below (*Fig. 65*) is devised by Major Meurice Sinclair, C.M.G., chiefly for use in bone-plating operations. They are generally used in pairs, and Major Sinclair in his articles in the *British Medical Journal*, Nov. 17, 1923, and April 25, 1925, states that their use shortens and greatly simplifies this operation. Down Bros. Ltd., London, are the makers.



SECTION OF PLATE
Fig. 65.

out and furnished with 'kick-ups' so as to ensure the appliance slipping when being manipulated *in situ*.

FULL
SIZE



Fig. 66.

Boot Clamp.—In a recent number of the *Practitioner*, Major Meurice Sinclair describes a boot clamp (*Fig. 67*) for use in cases of fracture of the lower limb. It is fixed on to the sole of the boot, and the two side screws rest on the lateral bars of a Jones' leg splint, thus bringing the foot into the desired position. The makers are Down Bros. Ltd., London.



Fig. 67.

Boots, for Operations (Pearce Gould's).—These boots (*Fig. 68*) are an improved form of overshoe for use during operating, superior to the usual type of Wellington or canvas boot. They are made with rubber soles, and uppers of material which is practically waterproof, and they may be repeatedly sterilized either by boiling or in the steam sterilizer. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

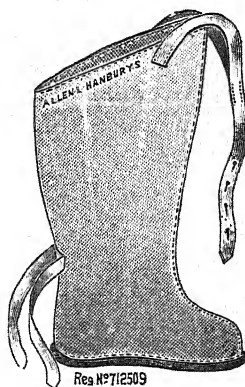


Fig. 68.

Cannulae.—Down Bros. Ltd., London, have made for Dr. Ewart Martin, of Edinburgh, a set of three attic cannulae for irrigation and aspiration. The shape and form of this instrument are shown in the attached illustration (*Fig. 69*).

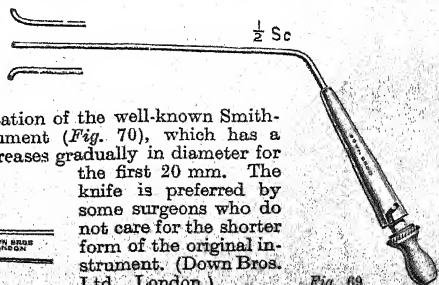


Fig. 69.

Cataract Knife.—This is a modification of the well-known Smith-Wilson cataract knife. The instrument (*Fig. 70*), which has a straight back and is 35 mm. long, increases gradually in diameter for the first 20 mm. The knife is preferred by some surgeons who do not care for the shorter form of the original instrument. (Down Bros. Ltd., London.)

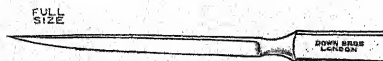


Fig. 70.

Catgut, Silk-reinforced.—G. F. Merson, Ltd., St. John's Hill Works, Edinburgh, prepare their surgical ligatures (*Fig. 71*) from the intestines of freshly killed sheep, in finished form ready for immediate use. They have recently introduced a catgut made especially strong by the introduction of some very fine strands of silk. This has the additional advantage of preventing all risk of slipping at the knot, and the tension is so adjusted that when the catgut is absorbed the suture loop does not become loose. This is a distinct practical help to surgery.



Fig. 71.

other measures can be carried out in the bladder and, on withdrawal, in the urethra as well. Full particulars will be supplied on request.

Diagnosis Set (Electric).—R. Sumner & Co. Ltd., of Liverpool, send us a very handy set of instruments for diagnosis, light being obtained from a small dry battery. The set includes Ophthalmoscope, Ear Speculum, Nasal Speculum, Throat Lamp, and Tongue Depressor. These are fitted into a roll case which is easily carried and is a great convenience to the practitioner, who is thus able to carry out a full examination under all conditions. The illustration (*Fig. 72*) shows the ophthalmoscope which is included. The cost is four guineas.



Fig. 72.

Diathermy Instruments.—Drs. Cumberbatch and Robinson have written a series of articles on the treatment of gonococcal infection by diathermy, and described a number of instruments designed for this

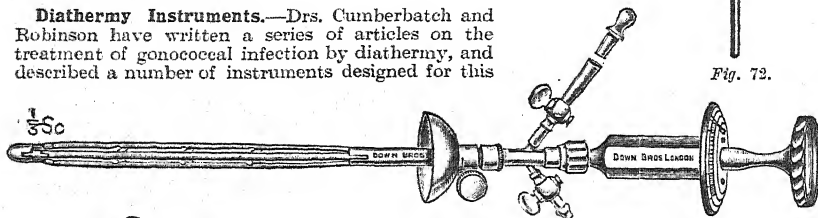


Fig. 73.

purpose. They are made by The Holborn Surgical Instrument Co. Ltd., London, who will supply all particulars and illustrations.

Dilator for the Male Urethra.—*Fig. 73* shows a modified form of Kollmann's dilator designed by Mr. David Lees, D.S.O., of Edinburgh. The modification consists in an alteration of the internal mechanism, so that this appliance can be used for suction with a Bier's rubber ball or syringe, and alternatively, irrigation can be employed. The instrument is made by Down Bros. Ltd., London.

Epistaxis Clip (Porter's).—This is a simple but effective instrument (*Fig. 74*) for controlling hæmorrhage from the nose. It is a great improvement upon the usual form of epistaxis plug, as it is more easily applied and, being made from metal, does not perish like rubber appliances. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Forceps (Artery).—Mr. Johnston Smith, of Singapore, has devised the half-ring artery forceps illustrated (*Fig. 75*), to facilitate the placing of ligatures on bleeding points in difficult positions. Down Bros. Ltd., London, are the makers.

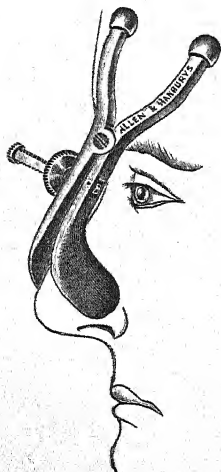


Fig. 74.

Forceps (Suture).—Mr. E. Drybrough-Smith, of St. Leonards-on-Sea, has designed a cross-action autostatic forceps (*Fig. 76*) for holding and everting suction edges while suturing. They are designed to save time, and permit the surgeon to use both his hands to thread, pass, and tie the suture when operating without an assistant. A strong spring firmly approximates the blades—thus the skin edges are automatically held tightly together; the teeth are long and firmly grip into the skin, at the same time everting its edges. In applying the forceps, both edges are

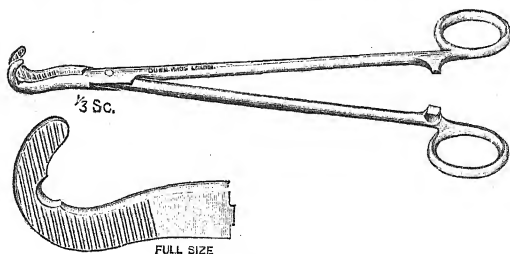


Fig. 75.

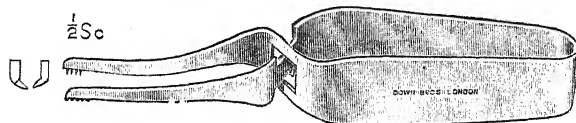


Fig. 76.

gripped simultaneously, the needle is passed just distal to the ends of the blades, and the suture tied before removing the forceps. (Down Bros. Ltd., London.)

Fractured Femur (Souttar's Frame

for Treatment of).—This consists of a steel tube frame which can be attached by means of clamps to any hospital bedstead. The amount of abduction is almost unlimited, and extension can be applied in any direction. It is a great improvement upon the Balkan frame, which was not sufficiently rigid, was cumbersome, and prevented the patient being moved. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Gag (Jack for Use with Davis).—Mr. V. E. Negus (King's College Hospital) writes: When a Davis gag is used for tonsillectomy it is necessary that someone should support it in order to keep the lower jaw raised and the airway open. This is both tiring and wasteful of energy. Therefore the appliance illustrated (*Fig. 77*) has been designed to take the place of the hand of the anaesthetist or assistant. A foot-plate (A) rests on the patient's chest; it supports a rigid upright rod provided with a

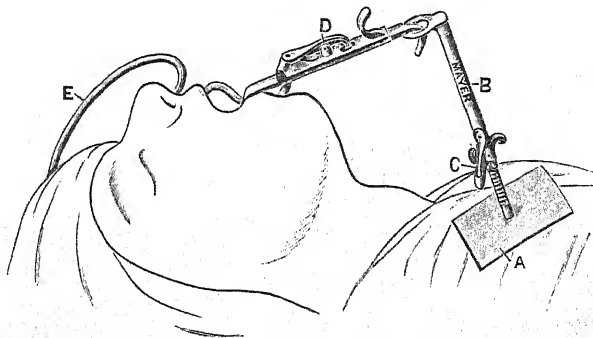


Fig. 77.

rack on one side and a slot on the other. A tube (B) slides up and down on the upright rod and engages at the top with the gag (D), which it supports by means of a ring. A ratchet (C), with a spring, engages with the teeth of the rack and can be freed by an upward pull of the finger. By adjusting the instrument the gag can be supported at any height above the chest between the extremes of four and eight inches. An intranasal, intratracheal catheter is shown at E. The instrument is made by Mayer & Phelps, 59-61, New Cavendish Street, W.1.

Galvanic Apparatus (Portable).—This is a remarkable invention which makes the

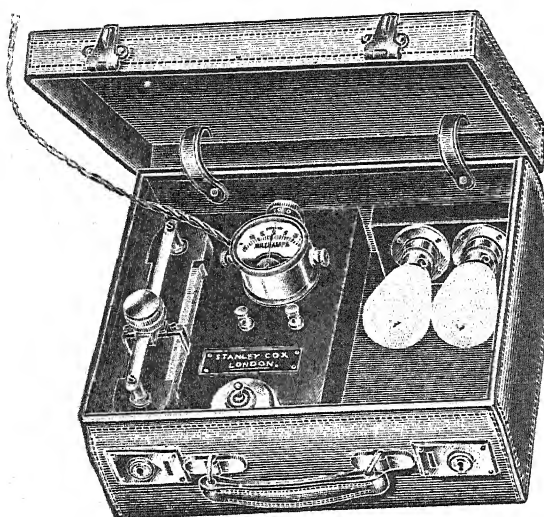


Fig. 78.

application of electricity, whether for galvanization, electrolysis, or ionization, as easy to give at the patient's bedside as in the consulting room, provided there is electric lighting available. It is light and portable, and can be used on any voltage from 100 to 250 volts. The general construction of the apparatus will be seen from the illustration (*Fig. 78*). All the parts are mounted on ebonite, and the milli-ampèremeter is dead beat of the D'Arsonval type. It is contained in a solid leather case, and costs £10 10s. (A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.)

tonsil, the lever is pushed upwards. If desired, the lever may be left in the position before finally cutting off the tonsil, in which case the dull blade will act as a hæmostat. (The Holborn Surgical Instrument Co. Ltd., London.)

Hæmorrhoids (Injection Treatment for).

—This is apparently one of the simplest

Gaillotine.—We here illustrate (*Fig. 79*) Sluder's latest improved guillotine with thumb lever. After the blade is closed down on the

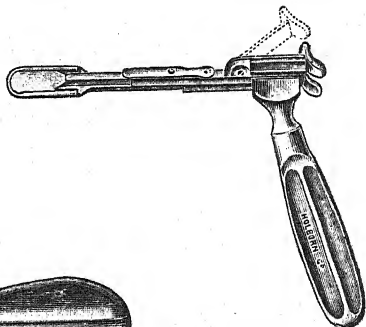


Fig. 79.

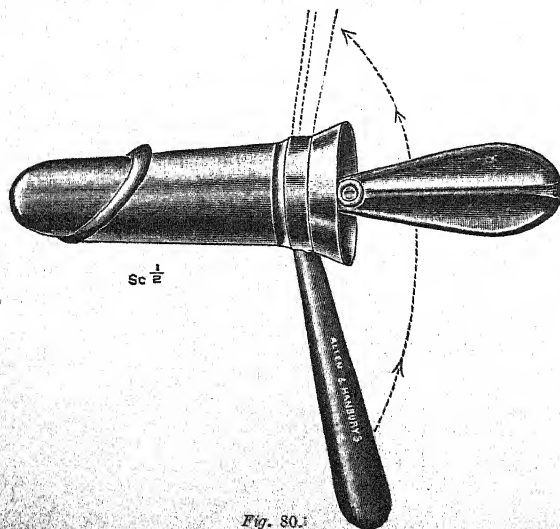


Fig. 80.

operations in surgery, but it is found that to obtain efficient and painless results great attention to detail, and some experience, are necessary. We would strongly advise the reader to refer to the article by Dr. James Searson which appeared in our 1916 volume. Dr. Graeme Anderson preferred the type of speculum which we illustrate (*Fig. 80*).

This is excellent for diagnostic purposes, but when the position of the pile is discovered we prefer the slotted kind which brings the pile nearer to the orifice of the speculum and is easier to puncture. Dr. Graeme Anderson also used a special forceps for holding the pile while being injected, and had a syringe which held only $\frac{1}{10}$ min. of the 10 per cent solution of carbolic acid which he employed. Mr. W. S. Whitcombe thinks the injection treatment is only suitable in simple, uncomplicated cases, and recommends the galvano-cautery, which he regards as painless and successful in every class of case. We illustrate the burners he recommends (*Fig. 81*). As the great object of those who use the injection treatment is to avoid a

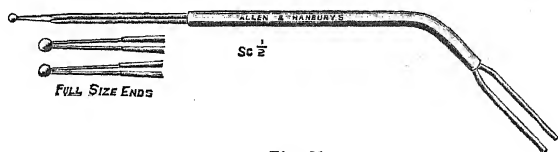


Fig. 81.

solution strong enough to act as a caustic, the proposal to use the cautery in every case requires some reflection before it is adopted. Allen & Hanburys Ltd., London, supply these instruments.

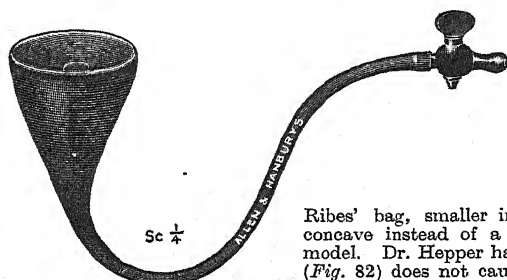


Fig. 82.

Induction Bag (Hepper's).—

This is a modification of the well-known Champetier de

Ribes' bag, smaller in diameter, and made with a concave instead of a convex end, as the original model. Dr. Hepper has found that this new pattern (*Fig. 82*) does not cause displacement of the head, in the manner of the de Ribes' bag. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Irrigator, Urethral.—Mr. Moolgavkar, of Bombay, has modified the usual type of Valentine irrigator by adding removable tips and removable shield to which an outflow tube has been attached (*Fig. 83*). This addition, together with the convenient

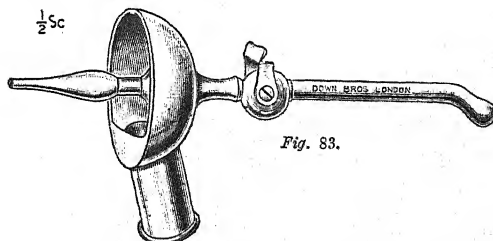


Fig. 83.

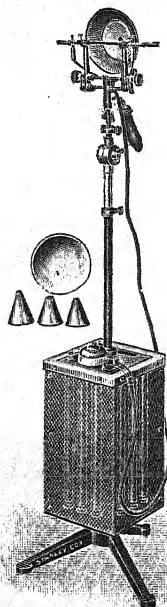


Fig. 84.

shape of the inflow tube and position of the stopcock which is incorporated in the pipe, will appeal to many who have to do much urethral irrigation work. Down Bros. Ltd., London, are the makers.

Lamp (Tungsten Arc).—This is an ultra-violet ray lamp for local application. It is designed to treat cavities such as ear, throat, nose, vagina, or rectum, the gums, or any sloughing wound or fistula. It focuses highly concentrated rays on to any circumscribed surface varying from the size of a shilling, and, by means of the speculum supplied, the smallest cavity can be exposed. The lamp as illustrated (*Fig. 84*) is supplied with one pair of Tungsten electrodes for use on any direct current supply for £12 12s., but for the alternating current the cost is £40. (A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.)

Lamp (Brawoodine Head).—This lamp (*Fig. 85*) is attached to the head and contains a 16-c.p. lamp which can be connected to the main through an ordinary lamp socket or wall plug. It has a connecting plug which can be used for either purpose. The advantage of brilliant direct illumination without the fear of a dry cell to run down during, or before, use is obvious. It is packed in a neat aluminium case and costs 42s. 6d. Give voltage required when ordering. It is supplied by A. E. Braid & Co. Ltd., 30, Gower Place, W.C. 1, and also by The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.

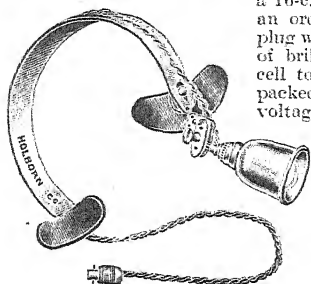


Fig. 85.

Moist-air Bath (Auto-condensing).—This bath has been designed by Dr. Percy Wilde to enable the pyretic treatment of rheumatism or allied diseases to be carried out on the bed in which the patient sleeps (*Fig. 86*), either in the hospital ward, or private house.

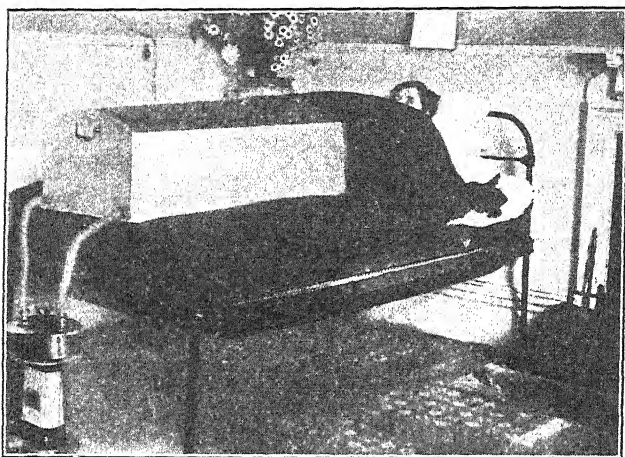


Fig. 86.

The remarkable feature of this appliance is that although steam is used for heat, it is automatically condensed and returned to the boiler, so that the bed does not become wet, or steam escape into the room. At the same time a sufficient amount of moisture to give the right atmosphere is automatically liberated.

The difficulty in carrying out pyretic treatment has always been the skill and attention to detail necessary to obtain satisfactory results. With this appliance, given a pint of hot water and an oil stove, all the necessary conditions are mechanically arranged for, and efficient results are certain. (The Cox-Cavendish Electrical Co. (1924) Ltd., 105, Great Portland Street, W.1.)

Nasal Sinuses (Instruments for Exploration of).—This set (*Fig. 87*), designed by Mr. A. Loundes Yates, consists of sphenoidal cannule, antral cannula and trocar, and malleable cannule, and is intended for use where it is desirable to explore the main group of sinuses in cases of toxic absorption, or to obtain material for the purpose of cultivation from the interior of the larger sinuses. The set is contained in an aseptic case, and the instruments are held in a cruet-like stand. It is supplied by Mayer & Phelps, 59-61, New Cavendish Street, W.1.

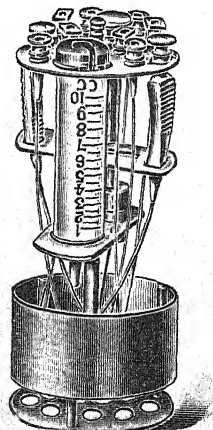


Fig. 87.

Nebulizer (Portable).—R. Sumner & Co. Ltd., of Liverpool, have introduced a new form of nebulizer (*Fig. 88*) which can be carried in the pocket. It is a trifle large for this purpose, but it is well made and supplied in a flexible leather case. The contents are quite unspillable, and it would be most useful to patients who are travelling or require to take their nebulizer with them to business, etc. It costs 10s. 6d.

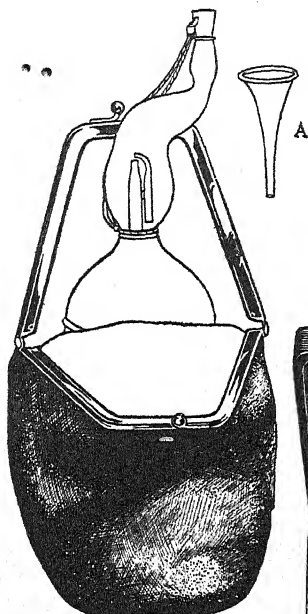


Fig. 88.

and Co. Ltd., of Liverpool. Particulars of this instrument have also been sent us by Allen & Hanburys Ltd., 48, Wigmore Street, W., and The Holborn Surgical Instrument Co. Ltd., London.

Ophthalmoscope (May's Prism).—This instrument has a prism, silvered on its facet, instead of the reflecting mirror in the usual types of ophthalmoscope. This prism gives a distinct circle or line of light according to the adjustment, which can be altered by the operator at will. The electric lamp is three-volt, and the batteries are 'Ever Ready,' which can always be easily obtained. In a compact case, as illustrated (*Fig. 89*), it costs 60s., and is supplied by R. Sumner

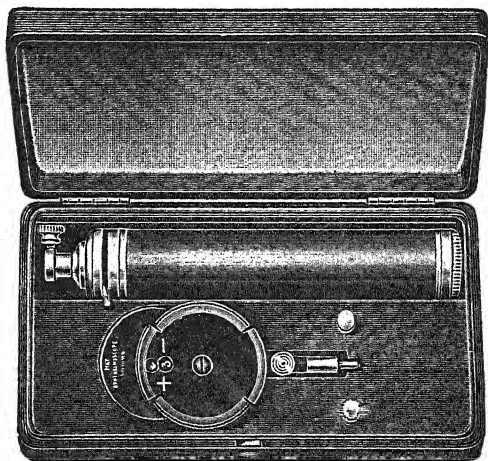


Fig. 89.

Pneumothorax Needle (Chandler's).—This needle (*Fig. 90*) is fitted with a trocar point which greatly facilitates introduction through the skin. The point is stronger than in the usual patterns, and does not require sharpening so frequently. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

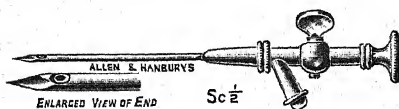


Fig. 90.

Pocket Knife (Surgical).—This instrument (*Fig. 91*) is made of stainless steel, and can be carried in the waistcoat pocket. It is a most useful addition to one's resources, and is supplied by The Holborn Surgical Instrument Co. Ltd., London.



Fig. 91.

Politzer's Bag.—This form of bag has been designed by Sir James Dundas Grant so that a nozzle is introduced for applying medicated vapours. In the capsule is placed a pledget of cotton-wool, and on this can be dropped a small quantity of any required medicament. Sir James Dundas Grant usually employs a combination

of menthol, chloroform, acetic ether, and alcohol, the vapour from which passes readily up the Eustachian tubes. (Mayer & Phelps, 59-61, New Cavendish Street, W.1.) (*Fig. 92.*)

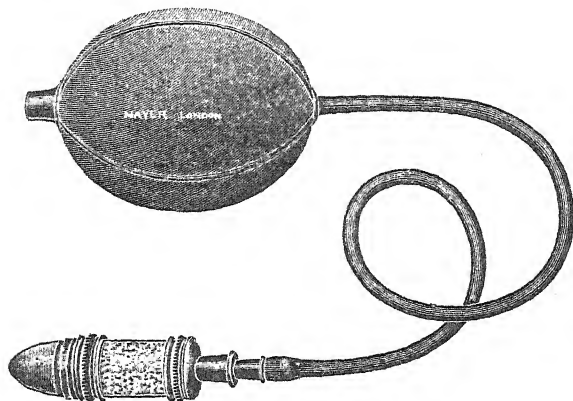


Fig. 92.

Provis's Apparatus.—An improved apparatus (*Fig. 93*) for carrying out Reuben's test for the patency of Fallopiian tubes is made by Allen & Hanburys Ltd., 48, Wignmore

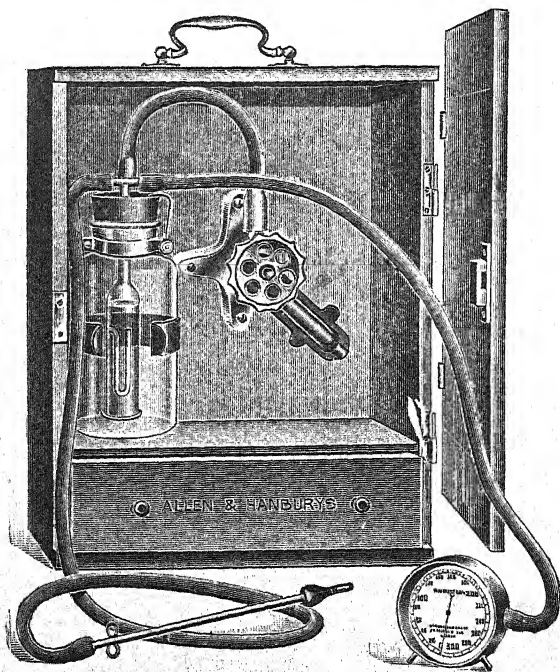


Fig. 93.

Street, W.1. It is fitted with finely adjusted needle valve, through which gas may be readily controlled, and supplied complete with measuring chamber and pressure gauge.

Retractor (Wakeley's).—This is a modified rib retractor, fitted with a large T-shaped handle, detachable (*Fig. 94*), instead of the original small ring handle, thus increasing the efficiency of the instrument. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

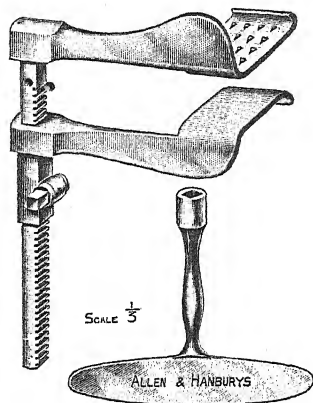


Fig. 94.

Scissors and Dressing Forceps (combined).—The ingenious construction of this instrument will be understood from the illustration (*Fig. 95*). The

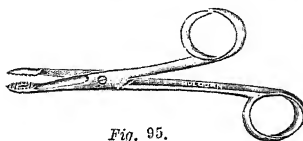


Fig. 95.

longer bow is placed on the first or second finger, and can remain there while the other fingers are occupied, and the forceps is thus at hand when wanted. (The Holborn Surgical Instrument Co. Ltd., London.)

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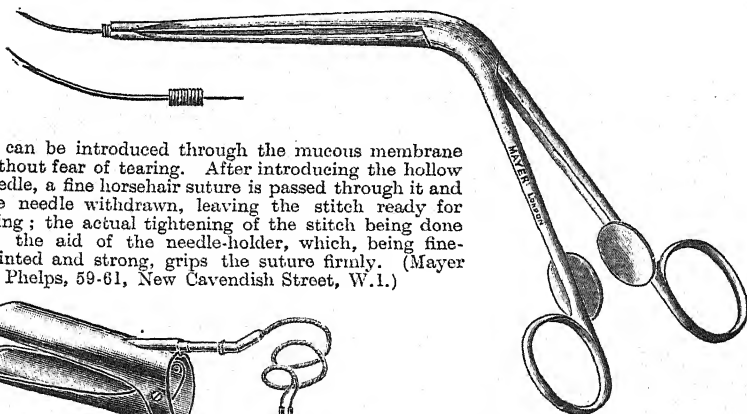


Fig. 96.

It can be introduced through the mucous membrane without fear of tearing. After introducing the hollow needle, a fine horsehair suture is passed through it and the needle withdrawn, leaving the stitch ready for tying; the actual tightening of the stitch being done by the aid of the needle-holder, which, being fine-pointed and strong, grips the suture firmly. (Mayer & Phelps, 59-61, New Cavendish Street, W.1.)

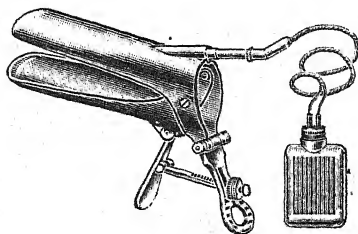


Fig. 97.

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Fig. 98.

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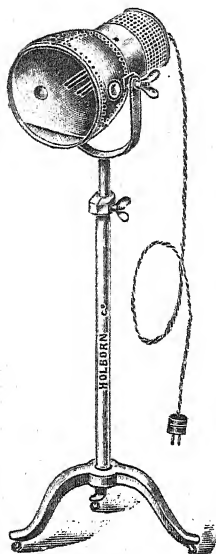


Fig. 99.

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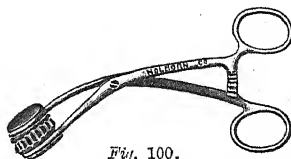


Fig. 100.

Tonsil Dissector.—Hurd's tonsil dissector and pillar retractor (*Fig. 101*) is an American instrument which has proved



Fig. 101.

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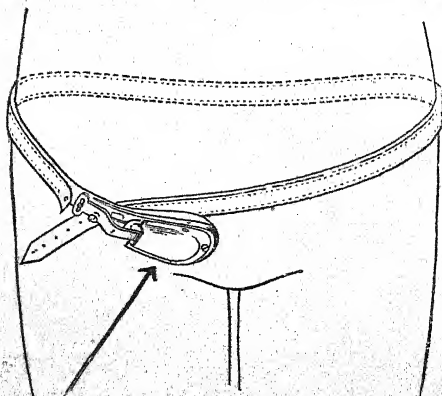


Fig. 102.

The mechanical advantage is obvious, and there is no doubt of the greater comfort to the patient. We strongly advise our readers to write to Alexander & Fowler, 104-106, Pembroke Place, Liverpool, for particulars of this truss, as we think it will be a great relief to many patients to have it, and also add to the efficiency of the support afforded to them.

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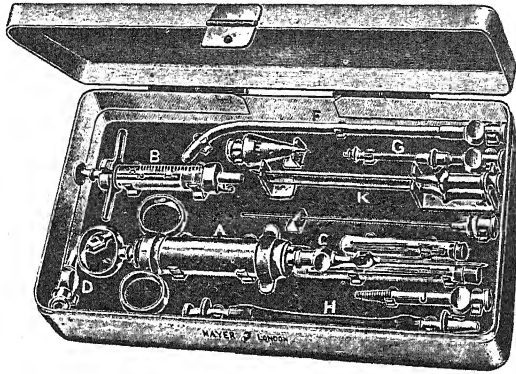


Fig. 103.

requirements, including lumbar puncture] (*Fig. 103*). It is designed by Mr. T. E. Hammond, and supplied by Mayer & Phelps, 59-61, New Cavendish Street, W.1.

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Fig. 104.

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Cheadle (Cheshire).—*Cheadle Royal Mental Hospital.* Res. Med. Supt., J. A. C. Roy, M.B., Ch.B. Heald Green, 1 mile. *See also Advt., p. 100*

Chester.—*Cheshire County Mental Hospital.* Res. Med. Supt., G. Hamilton Grills, M.D. Chester station, 1½ miles.

Chichester.—*West Sussex Mental Hospital,* Graylingwell. Res. Med. Supt., Dr. H. A. Kidd, C.B.E. Chichester station, 1½ miles.

Church Stretton.—*Stretton House.* Near Shrewsbury, Shropshire (for gentlemen). Man. Director, Col. A. A. Watson, C.M.G., D.S.O. Res. Med. Supt., Dr. E. Ormond Bowie. Church Stretton station, ¼ mile. *See also Advt., p. 97*

The Grove House, All Stretton, Shropshire (for ladies). Res. Prop. and Med. Supt., Dr. J. McClinton.

Clonmel.—*District Mental Hospital.* Res. Med. Supt., Dr. Bagenal C. Harvey. Clonmel, 1 mile.

Colchester.—*Essex and Colchester Mental Hospital,* Severalls. Res. Med. Supt., Dr. R. C. Turnbull. Colchester, 1½ miles.

Cork.—*Cork District Mental Hospital.* Res. Med. Supt., Dr. O. F. McCarthy. Cork, 2½ miles.

Lindville Private Mental Hospital, Cork. Prop., Mrs. Osburne. Res. Med. Off., Dr. N. Williams. Cork station, 2 miles by tram.

Cupar (Fifeshire).—*Fife and Kinross District Asylum.* Res. Med. Supt., James H. Skeen, M.B. Springfield station, N.B.R., ¾ mile.

Darlington (Durham).—*Middleton Hall,* Middleton St. George. Res. Med. Supt., L. Harris-Liston, M.D. Dinsdale station, 1 mile.

Dartford (Kent).—*City of London Mental Hospital,* near Dartford. Res. Med. Supt., Dr. William Robinson. Dartford, S.E.R., 2 miles.

Denbigh (North Wales).—*North Wales Counties Asylum.* Med. Supt., Frank G. Jones, M.D. Denbigh, 1 mile.

Derby.—*Borough Mental Hospital,* Rowditch. Res. Med. Supt., Dr. John Bain. L. & N.E.R. station, 1 mile; L.M. & S.R., 2 miles. *See also Advt., p. 104*

The County Mental Hospital, Mickleover, Derby. Res. Med. Supt., Dr. G. N. Bartlett. Derby, L.M. & S.R., 5 miles; Mickleover, L. & N.E.R., 2 miles.

Devizes.—*Wilt County Mental Hospital.* Res. Med. Supt., S. J. Cole, M.D. Devizes, 1 mile.

Dorchester.—*Dorset Mental Hospital.* Res. Med. Supt., G. E. Peachell, M.D. Dorchester, 3 miles.

Downpatrick.—*Down District Asylum.* Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and L. M. Downpatrick, 1 mile.

Dublin.—*Bloomfield,* Morehampton Rd. Med. Off., H. T. Bewley, M.D. Dublin, 1 mile.

Farnham House and Maryville, Finglas, Dublin. Res. Med. Prop., Dr. H. R. C. Rutherford. Cab from Dublin, 2 miles.

Grangeorgman Mental Hospital, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan. Also *Portrane Branch,* Donabate, Co. Dublin. Dep. Res. Med. Supt., Dr. Patrick J. Dwyer. Donabate station, 1½ miles.

Highfield (for ladies), *Drumcondra*; *Hampstead* (for gentlemen), Glasnevin. Res. Med. Supts., Hy. M. Eustace, B.A., M.D., and Wm. N. Eustace, L.R.C.P.I. & S.I. By rail, Dublin. *See also Advt., p. 103*
House of St. John of God, Stillorgan, Dublin. Res. Phys., Dr. J. J. Boland. Stillorgan station, ¼ mile.

St. Patrick's Hospital, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. *Branch Asylum, St. Edmonds-bury,* at Lucan. *See also Advt., p. 94*

St. Vincent's Asylum, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superioress.

Stewart Institution, Palmerston, Co. Dublin. Res. Med. Supt., G. H. Keene. M.D. Kingsbridge, 2½ miles.

Terville Retreat, Clontarf, near Dublin. Prop., P. D. Sullivan, F.R.C.S.I.

Dudley (Stafford).—*Ashwood House*, Kingswinford. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., 3½ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also *Advt.*, p. 105

Dumfries.—*Crichton Royal*. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

Dundee.—*Baldovan Institution* (for the treatment and education of the feeble-minded). Res. Med. Supt., W. B. Drummond, F.R.C.P.E. Downfield, 1 mile; Dundee, 4½ miles.

Dundee Mental Hospital, Westgreen, Dundee. Res. Med. Supt., W. Tusch-Mackenzie, M.D. Dundee, 3 miles; Liff, 1½ miles.

Dundee Royal Asylum, *Gourie House*, Dundee. Med. Off., A. B. Dalgetty, M.D. Sec., J. Wilkie, 20, Reform Street, Dundee.

Durham.—*County Asylum*, Winterton. Res. Med. Supt., Dr. H. G. Cribb. Sedgfield station, 2½ miles, by bus.

Gateshead Mental Hospital, Stannington, Northumberland. Res. Med. Supt., Lt.-Col. J. V. G. B. Tighe, M.B. Stannington, L. & N.E.R., 2½ miles.

Sunderland Borough Mental Hospital, Ryhope, Durham. Res. Med. Supt., Dr. M. A. Archdale. Ryhope station, 1 mile.

Edinburgh.—*Edinburgh District Mental Hospital*, Bangour Village, West Lothian. Res. Med. Supt., J. Keay, M.D. Uphall, L. & N.E.R., 2 miles.

Midlothian and Peebles District Asylum. Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

New Saughton Hall, Polton, Edinburgh. Res. Med. Supt., S. R. Macphail, M.D. Edin. Polton, 5 minutes; Loanhead, 10 minutes' walk. See also *Advt.*, p. 98

Royal Edinburgh Asylum, Morningside. Res. Phys. Supt., Professor George Robertson. *Craig House and West House*, for private patients. Edinburgh, 1½ miles.

Elgin.—*Morayshire District Asylum*. Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. D. G. Campbell. Elgin, 1½ miles.

Ennis (Co. Clare).—*Clare Mental Hospital*. Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

Enniscorthy (Co. Wexford).—*District Lunatic Asylum*. Res. Med. Supt., Dr. H. T. J. Kennedy. Enniscorthy, 1 mile.

Epsom (Surrey).—*The Silver Birches*, Church Street (for ladies). Licensees, Miss Daniel (Res.), Dr. E. G. C. Daniel. L. & S.W.R. and L.B. & S.C.R., 5 minutes. Tel.: 346 P.O. Epsom. See also *Advt.*, p. 109

Essex.—*Brentwood Mental Hospital*, Essex. Res. Med. Supt., Dr. W. Gordon Masefield. Brentwood station, ½ mile.

Littleton Hall, Brentwood, Essex (for ladies). Res. Med. Supt., Dr. H. G. L. Haynes. Brentwood, 1 mile; Shenfield, 1½ miles.

Exeter.—*City Mental Hospital*, Digbys, Heavitree. Res. Med. Supt., D. McKinlay Reid, M.D. Exeter, 3 miles.

Court Hall, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., and Miss A. S. Mules, M.R.C.S. Starcross, 1 mile.

Devon Mental Hospital, Exminster. Res. Med. Supt., Richard Eager, O.B.E., M.D. Exminster, 1½ miles; Exeter, 4 miles.

Wonford House Hospital for the Insane, Exeter. Res. Med. Supt., W. B. Morton, M.D. Exeter station (Queen St.) 1½ miles; (St. David's), 2 miles.

Fairford (Gloucestershire).—*Fairford Retreat*. Res. Med. Prop., Dr. A. C. King-Turner. Fairford, 1 mile.

Fareham (Hants.).—*Knowle Mental Hospital*. Res. Med. Supt., Dr. J. L. Jackson. Knowle, ½ mile.

Glasgow.—*District Mental Hospital*, Woodilee. Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

Glasgow District Mental Hospital, Gartloch, Gartcosh. Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile.

Glasgow Royal Mental Hospital, Gartnavel. Res. Med. Supt., D. K. Henderson, M.D.

Govan District Asylum, Hawkhead, Halfway Houses, Glasgow. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

Kirklands Mental Hospital, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, ½ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station, ½ mile.

Smithston Asylum, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West, 1½ miles; Ravenscraig, ½ mile.

Gloucester.—*Barnwood House*. Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. See also *Advt.*, p. 107

Gloucester County Mental Hospitals, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. J. Marnan. Gloucester station, 1 mile.

Guernsey.—*St. Peter Port Asylum*. Med. Off., E. K. Corbin, M.R.C.S.

Haddington, N.B.—*East Lothian District Asylum*. Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

Hatton (near Warwick).—*County Mental Hospital*. Res. Med. Supt., A. T. W. Forrester, M.D. Also *Leigh House*, for private patients. Warwick, G.W.R. station, 3 miles.

Haywards Heath.—*Brighton County Borough Mental Hospital*. Res. Med. Supt., G. H. Harper-Smith, M.A., M.D. Haywards Heath, 1½ miles.

Hellingly.—*East Sussex County Mental Hospital*, near Eastbourne. Res. Phys. and Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly, 1 mile.

See also Advt., p. 108

Henley-in-Arden (Warwickshire).—*Glen-dossill House* (for both sexes). Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., ¾ mile.

Hereford.—*Hereford County and City Mental Hospital*. Res. Med. Supt., J. G. Smith, M.D. Barrs Court, G.W. & L.M.S.R., Hereford, 3 miles.

Huddersfield (near).—*West Riding Mental Hospital*, "Storches Hall," Kirkburton. Res. Med. Supt., T. S. Adair, M.D. Kirkburton, L.M.S.R., 1 mile.

Hull.—*City Mental Hospital*. Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

Inverness.—*District Asylum*. Res. Med. Supt., T. C. Mackenzie, M.D. Inverness, 2½ miles.

Ipswich.—*Borough Mental Hospital*. Res. Med. Supt., Dr. W. M. Ogilvie. Ipswich, 2 miles.

Isle of Man.—*Mental Hospital*, Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B. Union Mills, ½ mile.

Isle of Wight.—*The County Mental Hospital*, Whitecroft. Res. Med. Supt., W. J. A. Erskine, M.D. Blackwater, ¾ mile; or Newport, 2½ miles.

Ivybridge.—*Plymouth Mental Hospital*. Res. Med. Supt., Dr. Wm. Starkey. Bittaford, ½ mile; Wrangaton, G.W.R., 1½ miles; Ivybridge, 3 miles.

Jersey.—*Jersey Asylum*. Res. Med. Supt., Julius Labey, M.R.C.S. Gorey Village, 1 mile.

Kilkenny.—*District Mental Hospital*, Kilkenny. Res. Med. Supt., Louis Buggy, L.R.C.P. & S.I. Kilkenny station, ½ mile.

Killarney.—*District Asylum*. Res. Med. Supt., E. W. Griffin, M.D. Killarney, ½ mile.

Lancashire (near Newton-le-Willows).—*Haydock Lodge*. Res. Med. Prop., Dr. C. T. Street. Newton-le-Willows, 2 miles.

Lancaster.—*County Mental Hospital*. Res. Med. Supt., D. M. Cassidy, M.D. Lancaster, L. & N.W. and L.M. & S.R. stations, each 1½ miles.

Larbert (Stirlingshire).—*The Royal Scottish National Institution* (for education of imbecile children). Res. Med. Supt., Dr. R. D. Clarkson. Larbert station, 1 mile.

Leek (Stafford).—*County Mental Hospital*, Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

Leicester.—*City Mental Hospital*, Humbersone. Res. Med. Supt., J. F. Dixon, M.D. Leicester, L. & N.-E. R. & L.M. & S.R., 2 miles.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Narborough, ½ mile; Leicester, 6 miles.

Letterkenny.—*Tirone District Mental Hospital*. Res. Med. Supt., J. C. Martin, L.R.C.P. & S.I., L.M. Letterkenny and Lough Swilly Rly., 1 mile.

Lichfield.—*County Mental Hospital*, Burntwood, near Lichfield. Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City, 3½ miles; Hammerwich, 1½ miles.

Limerick.—*District Asylum*. Res. Med. Supt., Dr. P. J. Irwin. Limerick station, ½ mile.

Lincoln.—*Bracebridge Mental Hospital*. Res. Med. Supt., Dr. John Macarthur, D.P.M. Lincoln, L. & N.E.R., 2½ miles.

The Lawn, Lincoln. Res. Med. Supt., J. E. Shortt, M.B., Ch.B. Lincoln station, 1 mile.

See also Advt., p. 100

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Phys., A. W. Wilcox, M.D. Formby, ½ mile.

See also Advt., p. 92

Tue Brook Villa, Liverpool. E. Res. Med. Supts., Drs. Tisdall and Moyes. Tue Brook station ¾ mile, or Green Lane car.

See also Advt., p. 109

London.—*Bethlem Royal Hospital*, Lambeth Road, London, S.E. Phys. Supt., J. G. Porter Phillips, M.D. F.R.C.P.

See also Advt., p. 93

Brooke House, Clapton, E. 5. Res. Med. Supt., Dr. Gerald Johnston. Clapton, G.E.R.

Camberwell House, 33, Peckham Road, S.E.5. Res. Med. Supt., H. J. Norman, M.B., Ch.B., D.P.H. Asst. Med. Offs., R. L. Nuthall, M.R.C.S., L.R.C.P., Miss M. T. McGeorge, M.B., Ch.B., and Miss D. M. Odium, M.A. (Oxon.), B.A. (Lond.), M.R.C.S., L.R.C.P. Telegrams: "Psycholia, London." Telephone, New Cross 2300, 2301.

See also Advt., p. 92

Chiswick House, Chiswick, W.4. Res. Med. Supt., Douglas Macaulay, M.D. Chiswick station, ½ mile; Turnham Green station, 1 mile.

See also Advt., p. 96

Clarence Lodge, Clapham Park, S.W. 4. Prop., Mrs. F. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. *See also Advt., p. 108*

Featherstone Hall, Southall (for ladies). Res. Med. Lic., A. N. Leatham, M.R.C.S., L.R.C.P. Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. *See also Advt., p. 96*

Flower House, Catford, S.E.6. Med. Supt., Dr. G. Stilwell, O.B.E. Res. Lic., Major P. à Beckett. S.E. & C. Rly., Beckenham Hill, 5 minutes.

Hallford House, Upper Hallford, Shepperton. S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, 1½ miles.

Hanwell Mental Hospital, Southall. Res. Med. Supt., A. W. Daniel, M.D.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon, N.W. 4. Med. Lic., H. J. de Caux, L.M.S.S.A., L.S.A. (Lond.). By L.M. & S.R., Hendon station, ½ mile.

Horton Mental Hospital, Epsom. Med. Supt., Lt.-Col. J. R. Lord, C.B.E., M.B., C.M. Epsom. S.R., 1½ miles; Epsom Town, 1½ miles.

London County Council, The Manor, Epsom. Res. Med. Supt., Dr. E. S. Littelljohn. S.R. and L.B. & S.C.R., 1½ miles.

London County Mental Hospital, Bantstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. A. A. W. Petrie. Belmont station, ½ mile; Sutton station, 1½ miles.

London County Mental Hospital, Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.E.R., 1½ miles.

London County Mental Hospital, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Lt.-Col. S. C. Elgee, O.B.E., L.R.C.P. & L.R.C.S. (I.). Coulsdon South or Coulsdon North (S. Rly.), 10 minutes.

London County Mental Hospital, Claybury, Woodford Bridge, Essex. Med. Supt., G. Foster Barham, M.D. Woodford Bridge station, G.E.R., 1½ miles.

See also *Advt.*, p. 109

London County Mental Hospital, Colney Hatch, N.11. Res. Med. Supt., S. J. Gilfillan, O.B.E., M.A., M.B. New Southgate, L. & N.E.R.

London County Mental Hospital, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Southern Rly.

Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W.17. Private Mental Hospital for 12 ladies and 16 gentlemen. Med. Supt., Dr. Noel Sergeant. Wandsworth Common, Balham and Streatham Hill stations, 1 mile. Motor bus Nos. 49, 49a, 49b, and 19a.

See also *Advt.*, p. 107

Northumberland House, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Finsbury Park station, 1 mile; Finsbury Park stations (Underground & G.N.), ½ mile.

See also *Advt.*, p. 94

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., Mrs. Sutherland. Lady Supt., Miss Brodie.

West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile.

See also *Advt.*, p. 108

Peckham House, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also *Advt.*, p. 96

Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

St. Luke's Hospital for Mental Diseases (re-building). (Offices, 19, Nottingham Place, W.)

See also *Advt.*, p. 62

The Priory, Roehampton, S.W., 15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

West Ham Mental Hospital, Goodmayes, Essex. Res. Med. Supt., Dr. John Custance Shaw. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.

Wyke House, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. (Edin.). Isleworth and Osterley stations, 1 mile.

See also *Advt.*, p. 97

Londonderry.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cormac, M.B., M.S., D.P.M. Macclesfield, 1 mile.

See also *Advt.*, p. 108

Maidstone.—*Kent County Mental Hospital*. Res. Med. Supt., H. Wolseley-Lewis, F.R.C.S., M.D. Maidstone West, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts.).—*Fiddington House*. Med. Supt., J. R. Benson, F.R.C.S. Vis. Med. Off., Dr. Nelson. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

See also *Advt.*, p. 105

Maryborough (Queen's County).—*District Mental Hospital*. Res. Med. Supt., Dr. Pierce Grace. Maryborough, ½ mile.

Melrose, N.B.—*Roxburgh, Bervick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton (Suffolk).—*St. Audrey's Hospital for Mental Diseases*. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

Menston (near Leeds).—*West Riding Mental Hospital*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, 1 mile.

Merstham (Surrey).—*County Mental Hospital*, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro' (Yorks).—*Mental Hospital*. Res. Med. Supt., Dr. J. W. Geddes. Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Monaghan, $\frac{1}{4}$ mile.

Montrose, N.B.—*The Royal Asylum.* Res. Med. Supt., C. J. Shaw, M.D. Hill-side, $\frac{1}{4}$ mile; Dutton, 1 mile.

Morpeth.—*Northumberland Mental Hospital.* Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Asylum.* Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital.* Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

Northampton.—*Berrywood Mental Hospital.* Res. Med. Supt., Dr. F. J. Stuart. L. & N.W. station, $2\frac{1}{2}$ miles; L.M. & S.R. station, 3 miles.

St. Andrew's Hospital, Northampton. Res. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. *See also Advt., p. 95*

Norwich.—*Bethel Hospital for Mental Diseases.* Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile.

See also Advt., p. 103

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D. Res. Phys., Dr. G. Stevens Pope. Thorpe station, $\frac{1}{2}$ miles. *See also Advt., p. 90*

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whittingham, 1 mile; Norwich. $2\frac{1}{2}$ miles.

The Grove, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McLintock.

Nottingham.—*City Asylum,* Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

Notts County Mental Hospital Nottingham. Res. Med. Supt., S. L. Jones, M.R.C.S. Radcliffe-on-Trent, 2 miles.

The Coppice, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, $2\frac{1}{2}$ miles; L. & N.E.R. station, $\frac{1}{2}$ miles. *See also Advt., p. 98*

Omagh (Co. Tyrone).—*District Asylum.* Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

Oxford.—*County and City Mental Hospital,* Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station.

The Warneford, Oxford, $\frac{1}{2}$ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station $2\frac{1}{2}$ miles. *See also Advt., p. 100*

Paisley.—*Craw Road Asylum.* Vis. Med. Off., H. C. Donald, F.R.C.S. Res. Med. Off., Miss Margaret L. Johnston, M.B. Paisley, 1 mile.

Paisley Mental Hospital, Riccartbar. Res. Med. Off., Dr. Mary R. Knight. Paisley West, $\frac{1}{4}$ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, $2\frac{1}{2}$ miles.

Perth.—*District Asylum,* Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D. (Edin.). Perth station, under 2 miles.

Plympton.—*Plympton House,* Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also Advt., p. 107*

Portsmouth.—*Borough Mental Hospital.* Res. Med. Supt., H. Devine, O.B.E., M.D., B.S. (Lond.), F.R.C.P. Clerk and Steward, John C. Kersey. Fratton, $1\frac{1}{2}$ miles.

See also Advt., p. 97

Prestwich (near Manchester).—*County Mental Hospital.* Res. Med. Supt., Dr. D. Blair. Prestwich, $\frac{3}{4}$ mile.

Rainhill (nr. Liverpool).—*County Mental Hospital.* Res. Med. Supt., Dr. E. F. Reeve. St. Helens, 2 miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., $\frac{1}{2}$ mile.

See also Advt., p. 104

St. Albans.—*Herts County Mental Hospital,* Hill End. Res. Acting Med. Supt., Dr. W. J. T. Kimber. Hill End station, L. & N.E.R. (G.N. Section), 3 minutes.

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk.

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Laverstock House,* Salisbury. Res. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, $\frac{1}{2}$ miles.

See also Advt., p. 105

Old Manor Mental Hospital, Salisbury. Res. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes.

See also Advt., p. 104

Shrewsbury.—*Salop Mental Hospital,* Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury station, $2\frac{1}{2}$ miles.

Sleaford.—*Kesteven Mental Hospital.* Res. Med. Supt., I. R. Macphail, L.R.C.P. & S. Raucby, L. & N.E.R., $\frac{1}{4}$ mile.

Sligo.—*District Mental Hospital.* Res. Med. Supt., Dr. P. O'Doherty. Sligo, $1\frac{1}{2}$ miles.

Stafford.—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D. Stafford, 1 mile.

Stirling.—*District Mental Hospital*, Larbert. Med. Supt., R. B. Campbell, M.D. Larbert, 1½ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital*. Res. Med. Supt., H. Kerr, M.D. Aylesbury, 3¼ miles. *See also Advt., p. 106*

Talgarth.—*Mid-Wales Counties Mental Hospital*, Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Licensees, C. E. Hollins and Mrs. S. A. Michaux. Med. Attendant, Dr. Lawson. Tamworth station, ¾ mile.

Taunton.—*Somerset & Bath Mental Hospital*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House*. Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

Virginia Water.—*Holloway Sanatorium*, Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., — — — Asst. Med. Offs., T. E. Harper, L.R.C.P., C. Rutherford, M.B., Elizabeth Casson, M.B., and R. A. MacNab, M.B. Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's*, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D. *See also Advt., p. 99*

Wadsley (near Sheffield).—*South Yorkshire Mental Hospital*. Res. Med. Supt., W. J. N. Vincent, C.B.E., M.D. Wadsley Bridge, 1 mile; Sheffield, 4 miles.

Wakefield.—*West Riding Mental Hospital*. Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

Wallingford (Berks.).—*Berkshire Mental Hospital*. Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital*. Res. Med. Supt., E. S. Pasmore, M.D. Upper Warlingham, 3¼ miles.

Warrington (Lancs.).—*Lancashire County Mental Hospital*, Winwick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D. Warrington, 2½ miles.

Waterford.—*Bon Sauveur Mental Home*, Carriglea, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. J. C. Hackett. Dungarvan station, 3¼ miles.

District Mental Hospital, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford. (For the treatment and cure of mentally afflicted gentlemen.) Conducted by the Brothers of Charity. Superior, Rev. Bro. Regulus Bourke. Vis. Phys., Dr. P. Coghlan. Waterford station, 1 mile.

See also Advt., p. 102

Wells.—*The Mental Hospital*, Wells, Som. Res. Med. Supt., Dr. J. E. P. Shera. Wells station, 1½ miles.

Whitchurch (Salop).—*St. Mary's House*. (For ladies only.) Proprietress, Mrs. C. M. Gwynn. Whitchurch, 1 mile.

Whittingham (near Preston).—*County Mental Hospital*. Res. Med. Supt., Dr. R. M. Clark. Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Peritau House*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking (Surrey).—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

York.—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also Advt., p. 102

The Pleasaunce, York (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles.

The Retreat, York. Res. Med. Supt., H. Yellowlees, O.B.E., M.D. York station, 1½ miles.

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

York City Asylum, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., ½ mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BERKSHIRE.

Cumnor Rise, Oxford.—34 females. High-grade feeble-minded. Managers, Committee. Hon. Secretary, Honble P. Bruce, 4, Wellington Place, St. Giles, Oxford. (*Class A.*)

BUCKINGHAMSHIRE.

Winslow Union Workhouse, Winslow.—9 male, 33 female, adults. Feeble-minded and imbecile. Managers, Winslow Board of Guardians. (*Class B.*)

CHESHIRE.

Ashton House, 26, Village Road, Oxtou, Birkenhead. For 40 girls (high grade only). Supt., Miss O. M. Wilkinson. (Class A.)

Sandlebridge, near Alderley Edge.—321 males and females. Educable mentally defective children under 13 years of age. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded. Sec., E. M. Richards, 1, Brazenose Street, Manchester. (Class A.)

CORNWALL.

The Elizabeth-Barclay Home, Bodmin.—26 females. Matron, Miss E. Hunt; Hon. Sec., Miss M. I. Braddon, Skisdon, Wadebridge. (Class D.)

CUMBERLAND.

Durran Hill House, Carlisle.—65 females. Feeble-minded. Higher grade. Sec., T. W. Hunter, Archbishop's House, Westminster, S.W.1. (Class A.)

DERBYSHIRE.

Whittington Hall, Whittington, near Chesterfield.—400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W. 1. (Class A.)

DEVON.

Western Counties Institution, Starcross.—480 males and females (trainable children). Sec. Supt., C. W. Mayer. (Class A.)

DORSET.

Mount Tabor, Lower Parkstone.—Church of England institution for 18 females over school age. Supt., Sister Mary Frances. (Class A.)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne.—70 males. Sec., J. Stewart, 90 Pilgrim Street, Newcastle. (Class A.)

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow.—61 males. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E. 17. (Class A.)

Elloe House, Church Road, Leyton.—102 high-grade feeble-minded females, over 16. Corresponding Manager, as for Bigods Hall. (Class A.)

Royal Eastern Counties Institution, Colchester.—1100 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (Class A.)

The Co-operative Sanatorium, Billericay.—54 males of the middle class. Managers, The Co-operative Sanatoria Ltd. (Class A.)

The Institution, Tendring, Clacton-on-Sea, Essex.—26 males, 26 females. Managers, Guardians of the Tendring Union. Supt., H. J. Burden. (Class B.)

GLOUCESTERSHIRE.

Brentry Certified Institution, Westbury-on-Trym, Bristol.—264 males. Res. Supt., T. R. Lambert; Med. Off., Dr. Ormerod. Clifton Down, Redland, or Patchway stations, 3½ miles. (Class A.)

St. Mary's Home, Painswick, near Stroud.—29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—790 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also Advt., p. 67

Stoke Park Colony, West Side, Stapleton.—308 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stapleton Institution, Bristol.—55 adult males, 95 females and 25 children. Managers, Bristol Board of Guardians. Superintendent, A. F. Waters. (Class B.)

Royal Fort Home, Bristol.—20 females, high-grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Miss G. Savill, 40, Tyndall's Park Road. (Class D.)

HAMPSHIRE.

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. (Class A.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—43 males. Secretary, T. W. Hunter, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—136 males and females. Apply to T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Boxmoor House School, Boxmoor, Herts.—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

Rowley Lodge, Rowley Green, Barnet.—Educational home for 13 backward boys and girls. Principals, The Misses Wall and Binney. (Class C and D.)

See also Advt., p. 64

KENT.

Princess Christian's Farm Colony, Hildenborough.—78 males, 68 females. Managers, National Association for the Feeble-Minded. Superintendent, Miss Pitman. (Class A and D.)

LANCASHIRE.

Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.—123 male and female educable children. Superintendent, Sister E. Thompson. (Class A.)

Caldstones, Wailley, near Blackburn.—1050 males, 1358 females. Feeble-minded, imbeciles, idiots, and moral imbeciles. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (Class A.)

Pontville R.C. Special School, Ormskirk.—106 boys. Mentally defective. Corresponding Manager, Right Rev. Monsignor Canon Fanning, 109, Great Mersey Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 67

Seafeld House, Waterloo Road, Seaford, near Liverpool.—228 feeble-minded children. Managers, Guardians of the West Derby Union, Liverpool. (Class B.)

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester (with ancillary premises at *Cross Corners, 2, Thurcaston Road, Leicester*).—Feeble-minded of both sexes. Supt., Miss N. Russam. (Class A.)

LONDON.

39 and 41, *Downs Road, Clapton, E.5.*—50 females. Apply: Sec., Miss E. Walters, 39, *Downs Road, Clapton, E. 5.* (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N.—30 females. High-grade mental deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, 17, Church Row, Hampstead, N.W. 3. (Class A.)

Kensington Guardians' Institution, Marloes Road, W. 8.—60 females. Managers, Guardians of the Poor of the Parish of St. Mary Abbots, Kensington. Supt., Mr. Francis Birch. (Class B.)

Woolwich Workhouse, Plumstead, S.E.—25 males, 45 females sent by L.C.C. only. Managers, Board of Guardians of the Woolwich Union. Supt., E. G. Manning (Class B.)

MIDDLESEX.

All Souls' Special School, Field Heath House, Hillingdon.—89 females. Educable and imbeciles. Manager, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Bramley House, Clay Hill, Enfield.—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—20 women, 12 children. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W. 1. (Class A.)

Enfield House, 19, Chase Side Crescent, Enfield, Middlesex.—40 males. Managers, Guardians of Edmonton Union. Superintendent, E. B. Willett. (Class A.)

Normansfield, Teddington.—140 males and females of all ages. Manager, Dr. R. L. Langdon-Down. (Class C.)

See also *Advt.* p. 66

The Gables, Upper Teddington Road, Hampton Wick.—18 male and female children. Manager, Miss Frances M. Deck. (Class C.)

Alexander House, 117, High Street, Urbridge.—24 females over 16. Supt., Miss E. Collyer. (Class D.)

Conifers, Teddington.—20 females, and 3 male children. Manager, Dr. R. L. Langdon-Down. (Class D.)

Trematon, Teddington.—24 males. Manager, Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

The Lodge, Bowthorpe Road, Norwich.—6 adult males, 20 adult females. Managers, The Guardians of the Poor of Norwich. Supt., F. R. Smith. (Class B.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe.—420, all classes. Managers, Northern Counties Joint Poor Law Committee. Supt., Miss N. M. Hawkes. (Class A and B.)

NOTTINGHAMSHIRE.

Rampton State Institution, Retford.—Both sexes. Med. Supt., W. R. Thomas, M.D. (Class A.)

SOMERSET.

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 20 females. Supt., Mrs. O. G. Date. (Class A.)

Long Ashton Poor Law Institution, Flax Bourton, near Bristol.—32 males, 34 females. Managers, Guardians of the Long Ashton Union. (Class B.)

Yatton Hall, Yatton, near Bristol.—Both sexes. Supt., Miss J. McGill. (Class A.)

STAFFORDSHIRE.

Burton-on-Trent Poor Law Institution.—5 males, 2 females. Managers, Guardians of Burton Union. Master, R. Bareham. (Class A.)

New Cross Poor Law Institution, Mental Wards, Wolverhampton.—6 males. Managers, Wolverhampton Board of Guardians. Supt., T. D. Rollinson. (Class A.)

Poor Law Institution, Dudley, Stafford.—50 males, 60 females. Managers, Guardians of the Dudley Union. Master, P. Hopkin. (Class B.)

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—20 high-grade females. Supt., Miss Church. (Class A.)

St. Joseph's Home, The Croft, Sudbury.—20 females. Supt., Sister Veronica Wheelan. (Class A.)

SURREY.

Royal Earlswood Institution, Redhill.—300 males, 300 females. Med. Supt., Dr. S. Langton. Secretary, 14, Ludgate Hill, E.C. 4. (Class A.)

SUSSEX.

Aconhurst, Burgess Hill.—18 boys and girls. Manager, Miss S. M. Macdowall. (Class D.)

WARWICK.

Agatha Stacey Home, Rednal, near Birmingham.—40 females. The Managers, 158, Broad St., Birmingham. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—140 males. Supt., A. H. Williams. Med. Officer, J. O. Hollick, M.B. (Class A.)

Warwick State Institution, The Cape, Warwick.—Females only. Supt., Mrs. G. E. Newsome. (Class A.)

WILTS.

Devizes Poor Law Institution.—16 females between the ages of 20 and 50 years. Managers, Devizes Board of Guardians. (Class B.)

Poor Law Institution, Semington, near Trowbridge.—6 males, 30 females. Managers, Guardians Trowbridge and Melksham Union. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Besford Court Catholic Mental Welfare Hospital for Children, Besford, near Defford.—For 119 educable mentally defective boys from 13 to 21 years, and 60 boys from 7 to 13. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

Meanwood Park Colony, Meanwood, Leeds. 51 males, 123 females. Managers, Leeds City Council. Supt., Miss Langdown. (Class A.)

Mid-Yorkshire Institution, Wharfedale, York.—200 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

The Grange, Altofts, Normanton.—15 females, good class. Mentally deficient, epileptics. Proprietor, Mrs. E. A. Howard. (Class C.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

*NOTE—Ecclesfield, Ashford, is a Roman Catholic Religious Institution.

MALES ONLY.

Nuneaton (Warw.).—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles. See also Advt., p. 91

Rickmansworth (Herts.).—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, L. & N.E.R. & Metropolitan Rlwy, ¼ mile; L. & N.W.R., 1 mile. See also Advt., p. 89

FEMALES ONLY.

Ashford (Middlesex).*—*Ecclesfield.* Med. Supt., Dr. John Reid. Apply, Mother Superior. Ashford station, 1 mile. See also Advt., p. 91

Belfast.—*The Lodge Retreat, Irwin Avenue, Strandtown.* Med. Attend., R. W. Leslie, M.D. Matron, Miss R. Clarke.

Co. Down line train, 2 minutes' walk; G.N. by tram, 20 minutes.

Beverley (E. Yorks.).—*Albion House.* Med. Supt., H. L. Munro, M.D. Hon. Sec., Mrs. T. R. Pentith, Restholme, Sutton, near Hull. Beverley, 1 mile.

Reigate (Surrey).—*The Lady Henry Somerset Homes, Duxhurst.* Med. Off., Dr. Walters. Hon. Supt. and Res. Trustee, Miss Cass, O.B.E. Reigate, 4 miles; Horley, 3 miles.

Spelthorne St. Mary (Bedfont, Middlesex).—Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. Woods. Feltham, S.W.R., 1 mile.

Torquay.—*Temple Lodge* (C.E.T.S. Institution). Res. Supt., Sister in Charge. Med. Off., Dr. E. Catford.

See also Advt., p. 91

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium Ltd., The Mansion, Beckenham Park.* Med. Supt., A. W. George, M.D. Beckenham Junction, 10 minutes.

See also Advt., p. 89

Chislehurst (Kent).—*Heatherbank Ltd.* Med. Supt., Francis Hare, M.D.

See also Advt., p. 90

Paignton (Devon).—*Bay Mount,* small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

See also Advt., p. 91

Woodbridge (Suffolk).—*Norwood Sanatorium Ltd., Rendlesham Hall, Woodbridge.* Wickham Market station.

See also Advt., p. 89

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchaldor (N.B.).—*Inverness-shire Sanatorium, Invergarry.* Med. Supt., J. Kirtou, M.C., M.A., M.D. Aberchaldor, 2 miles.

Arosa (Switzerland).—*The Altein Sanatorium.* Res. House-Phys., Dr. H. Heinz. Man. Director, P. Wieland.

See also Advt., p. 71
Sanatorium Arosa, Inner-Arosa. Med. Supt., Dr. E. Jacobi. House Phys., Dr. H. Trenkel. *See also Advt., p. 68*

Ascot.—*Farmwood Sanatorium* (for both sexes). Cons. Phys., A. Hope Gosse, M.D., F.R.C.P. Apply, Secretary. Ascot, 1 mile. *See also Advt., p. xlix*

Ashford (Kent).—*Grosvenor Sanatorium,* Kennington, near Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Aysgarth, S.O. (Yorks).—*Wensleydale Sanatorium.* Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R.

See also Advt., p. 72

Baguley (Cheshire).—*Baguley Sanatorium.* For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, $\frac{1}{2}$ miles.

Banchory (Scotland).—*Nordrach-on-Dee.* Senr. Phys., Ian S. Stewart, M.D. Banchory, $\frac{1}{2}$ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne Sanatorium.* Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

Bingley (Yorks.).—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham.—*Municipal Sanatorium,* Yardley Road. Med. Supt., Dr. G. B. Dixon.

Romsley Hill Sanatorium, Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Hon. Sec., W. S. Aston, 45, Newhall Street, Birmingham. Halesowen, 4 $\frac{1}{2}$ miles.

St. Gerard's Sanatorium, Coleshill, near Birmingham. For Surgical Tuberculosis. Children only. Orthopædic Surg., Mr. Naughton Dunn. Med. Off., J. B. Wall, M.D.

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives,* Sharples. Med. Off., Dr. J. D. Marshall.

Boston (Lincs.).—*Holland Sanatorium.* Med. Supt., H. C. Jennings, M.B., D.P.H. Boston, 1 mile.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, $\frac{1}{2}$ miles; Bournemouth West, $\frac{1}{2}$ mile.

The Firs Home (for advanced cases). Hon. Sec., Col. R. F. Anderson. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

Bovey Tracey (Devon).—*Devon County Sanatorium,* Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

Bradford.—*Bierley Hall Sanatorium,* Bierley Lane. For 68 women and children only. Res. Med. Supt., Dr. L. G. White.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Treas., Lord MacLay, 21, Bothwell Street, Glasgow. Res. Med. Supt., James Crockett, M.D. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium,* for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Town Hall, Brighton. Brighton Central station, $\frac{1}{2}$ miles.

Buttevant (Co. Cork).—*Cork County and City Sanatorium,* Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Camberley (Surrey).—*Prior Place Sanatorium,* Heatherside. Res. Med. Supt., Dr. H. O. Blanford. *See also Advt., p. 70*

Camborne (Cornwall).—*Tekidy Sanatorium.* Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

Chagford (Devon).—*Dartmoor Sanatorium.* Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

Chandler's Ford (Hants.).—*Hants. County Council Sanatorium.* Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Cheltenham.—*The Cotswold Sanatorium,* near Stroud, Glos. Res. Med. Supts., A. H. Hoffman, M.D., and Geoffrey A. Hoffman, M.B. Cheltenham, 8 miles.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, $\frac{1}{2}$ miles; Cheltenham, $\frac{3}{4}$ miles.

Czechoslovakia.—*The Palace Sanatorium, Nový Smokovec.* Res. Med. Supt., Dr. Szontagh. *See also Advt., p. 66*

Darlington.—*Felix House,* Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Davos-Platz (Switzerland).—*Sanatorium Schatzalp.* Res. Med. Supt., Edward C. Neumann, M.D. By funicular from Davos-Platz. See also *Advt.*, p. 71

Park Sanatorium (formerly *Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bär, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 72
Reine Elisabeth, Davos. Apply, Fernand De Houx. See also *Advt.*, p. 70

Derbyshire.—*Ashover Sanatorium*, near Chesterfield. Res. Med. Supt., Dr. Stuart E. Gordon. Stretton, L.M. & S.R., 3½ miles; Matlock, 4 miles.

Derbyshire Sanatorium, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Supt., Dr. H. A. Crowther. Brent, G.W.R., 2 miles.

Dublin.—*Peamount Sanatorium*, Hazel-hatch, Dublin. Res. Med. Supt., Dr. G. P. H. Sheehan. Lucan, 2 miles.

Dundee (near).—*Sidlaw Sanatorium*, Auchterhouse. 54 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D., Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Sec., Geo. B. Brough. Auchterhouse station, 1½ miles.

Durham.—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope. Med. Supt., John Gray, O.B.E., M.B. Stanhope station, 1 mile. For women and children: Wolsingham. Med. Supt., Dr. E. G. D. Menzies. Wolsingham station, ¾ mile.

East Fortune (East Lothian).—*East Fortune Sanatorium.* Res. Med. Supt., Charles Cameron, M.D. East Fortune, ½ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption.* Under the supervision of Wm. Robertson, M.D., D.P.H., M.O.H., Public Health Department, Public Health Chambers, Johnston Terrace, Edinburgh.

Farnham (Surrey).—*Crooksbury Sanatorium.* Cons. Phys., F. R. Walters, M.D. Apply, Secretary. See also *Advt.*, p. 76

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases.* Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

See also *Advt.*, p. 50
Grange-over-Sands.—*Westmorland Sanatorium*, Meathop. Res. Med. Supt., C. F. Walker, M.D., D.P.H. Grange-over-Sands station, 2 miles.

Harpenden (Herts).—*Sanatorium of the National Children's Home and Orphanage.* Vis. Phys., T. N. Kelynaek, M.D. Principal, Rev. W. Hodson Smith, Highbury Park, London, N.5. See also *Advt.*, p. 73

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*Cleaver Sanatorium for Children.* Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, 1½ miles.

Hexham (Northumberland).—*Wooley Sanatorium.* Med. Supt., J. B. McDougall, M.D.

Huddersfield.—*Bradley Wood Sanatorium for Pulmonary and Surgical Tuberculosis*, Bradley. Res. Med. Supt., Dr. Robert Cunningham. Bradley, 1 mile.

Hull.—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproule, L.R.C.P. Withernsea station.

Huntingdon.—*Wyton Sanatorium* (for women and children). Med. Supt., C. B. Moss-Blundell, M.D. Huntingdon, ¾ miles.

Ilkley (Yorks.).—*Middletown Sanatorium*, near Ilkley. Res. Med. Supt., T. Campbell, M.D.

Isle of Wight.—*Royal National Hospital for Consumption*, Ventnor. Res. Med. Supt., Dr. R. C. Hutchinson. Sec., Charles W. Cox, 18, Buckingham St., Strand, W.C. Ventnor, 1 mile. See also *Advt.*, p. 50
St. Catherine's Home Sanatorium, Ventnor (for early cases of phthisis in children). Apply Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Ventnor, 5 minutes' drive.

Kingussie (Inverness-shire).—*Grampian Sanatorium.* Res. Med. Supt., Dr. Felix Savy. Kingussie, ¾ mile.

See also *Advt.*, p. 75
Kirkcaldy.—*Sanatorium for Tuberculosis.* Med. Supt., Dr. G. W. McIntosh. Res. Med. Off., Dr. Frank S. Anderson. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Lanark.—*City of Glasgow Sanatorium*, Bellefield, Lanark. Res. Med. Supt., Dr. Alex. Young. Lanark, 20 minutes' walk.

Leeds.—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby; *Leeds Sanatorium for Consumptives*, Killingbeck; and *Leeds Hospital for Consumptives*, Armley. For poor of Leeds. Sec., C. H. Sedgwick, 37, Great George Street, Leeds.

Leysin-Feydey (Switzerland).—*Station Climatérique de Leysin*: Sanatorium Grand Hotel (Dr. Jaquerod), Sanatorium Mont-Blanc (Dr. Piquet), Sanatorium Chamossaire (Dr. Sillig), Sanatorium Belvédère. Leysin-Feydey station, from 1 to 5 minutes. See also *Advt.*, p. 70

Liverpool.—*Fazakerley Sanatorium.* Res. Med. Supt., C. Rundle, O.B.E., M.D. *Highfield Sanatorium,* Liverpool. Med. Supt., H. R. Macintyre, D.S.O., M.C. M.D., D.P.H.

Liverpool Sanatorium for Consumptives, Kingswood, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of the Heart and Lungs,* Victoria Park, E. 2. Apply, Secretary. Cambridge Heath, G.E.R., Bus or Tram, 5 minutes.

Mount Vernon Hospital (Incorporated), Northwood. Res. Phys., Dr. W. G. Kinton. Out-patient department, 7, Fitzroy Square, W. Secretary, W. J. Morton. Northwood (Met. & L. & N.E. Ry.), 1 mile.

Royal Chest Hospital, 231, City Road, E.C. 1 (Section of the Royal Northern Group of Hospitals). Apply to the Secretary.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest,* Bowdon. Med. Supt., Dr. C. N. Aldred; *Crossley Sanatorium,* Delamere, Cheshire. Med. Supt., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Hardman Street, Manchester.

Margate (Kent).—*Royal Sea-bathing Hospital (for Surgical Tuberculosis).* Med. Supt., Dr. Basil Armstrong, M.C. Margate West, ¼ mile. Sec., A. Nash, Watergate House, 15, York Buildings, Adelphi, W.C.2.

Market Drayton.—*Cheshire Joint Sanatorium.* Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, 4½ miles.

Marple (Cheshire).—*Nab Top Sanatorium,* for residents of Salford only. Res. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, ¼ mile.

Matlock (Derbyshire).—*Matlock Sanatorium.* Res. Med. Supt., Dr. U. J. Bourke. Matlock, 1 mile.

Menai Bridge, Anglesey.—*Penhesgyn-y-Gors Sanatorium* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. D. W. Fenwick Jones. Matron, S. J. Bennett. Menai Bridge, 3 miles.

Mendip Hills.—*Mendip Hills Sanatorium,* Wells, Somerset. Res. Phys., Dr. T. C. Brentnall. Wells station, 3 miles.

See also *Advt.*, p. 74

Nordrach-upon-Mendip, Blagdon, near Bristol. Med. Supts., R. Thurnam, M.D., and Dr. D. Kennedy (Resident). Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium.* Res. Med. Supt., Dr. R. R. Trail. Midhurst, 4 miles.

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium.* Res. Med. Supt., Dr. J. M. Johnston. Murtle, ½ mile.

See also *Advt.*, p. 74

Nayland (Suffolk).—*East Anglian Sanatorium* for private patients, *Matings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium,* Nayland. Med. Supt., Dr. Jane Walker. Bures Station, L. & N.E.R., 3½ miles, Colchester, 8 miles.

See also *Advt.*, p. 74

New Cumnock (Ayrshire).—*Ayrshire Sanatorium,* Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*Children's Sanatorium for the Treatment of Phthisis, Incorporated,* Holt. Vis. Med. Off., Dr. H. F. Skrimshire, Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

Kelling Sanatorium, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, 1½ miles. *Mundesley Sanatorium,* Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., G. Lucas, M.D., and Dr. L. W. Sharp. Mundesley, 1 mile.

See also *Advt.*, p. 77

Northampton.—*Northamptonshire Sanatorium,* Creaton. Res. Med. Supt., Dr. C. Milne. Brixworth, L.M.S.R., 3 miles.

Nottinghamshire.—*Ransom Sanatorium* (Notts County Council), Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

Nuneaton (near).—*Bramcote Sanatorium,* Bramcote. Both sexes, 41 beds. Med. Supt., Dr. J. McG. Williams. Nuneaton, 3½ miles.

Oban, Scotland.—*Argyll County Sanatorium,* Benvoulin. Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

Oldham.—*Strinesdale Sanatorium.* Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

Peebles.—*Manor Valley Sanatorium.* Med. Off., C. B. Gunn, M.D. Peebles, 4 miles; Lyne, 2 miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium.* Res. Phys., C. H. Brodribb, M.B., B.S. (Lond.), L.R.C.P., and N. Berkley Ash, M.R.C.S., L.R.C.P. Penmaenmawr, L.M.S.R., 1 mile.

See also *Advt.*, p. 75

Peppard Common (Oxon).—*Berks. and Bucks. Joint Sanatorium.* Res. Chief Med. Off., Dr. Esther Carling. Reading, 6½ miles.

Ringwood (Hants).—*Linford Sanatorium.* Res. Med. Supts., A. de W. Snowden, M.D., Dr. J. D. Macfie, and Dr. A. G. E. Wilcock. Ringwood, 2½ miles.

Robertsbridge (Sussex).—*East Sussex Council Sanatorium.* Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, ½ mile.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 5 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium*, *Llanbedr Hall*. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. *See also Advt., p. 72*

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.E.R.; West Marina, L.B. & S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Res. Med. Supt., H. N. Marrett, M.R.C.S. Chelmsford station, G.E.R., 3½ miles.

Sandy (Beds.).—*The Bedfordshire County Sanatorium*, Mogerhanger Park. Med. Supt., C. G. Welch, M.D.

Sheffield.—*The City Sanatoria*. Crimicar Lane Sanatorium (males); Commonsides Sanatorium (females); Winter Street Sanatorium (both sexes); Fir Vale Sanatorium (children). Tuberculosis Med. Off., John Rennie, M.D. Sheffield, L.M.S., 4½ miles.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium for Children*. Res. Med. Supt., Dr. E. M. Whitehead. Embassy station, 2 miles.

Stannington (Northumberland).—*"Philpison" Children's Sanatorium*. Res. Med. Off., Dr. Elsie F. Farquharson. Med. Supt., T. C. Hunter, M.D. Matron, Miss M. Campbell. Stannington station, 2 miles.

Stonehouse (Glos.).—*Standish House Sanatorium*. Res. Med. Supt., W. A. Dickson, M.D., M.R.C.P., F.R.C.S. Stonehouse, G.W.R., 1½ miles; L.M.S.R., 2 miles.

Stourbridge (Wores.).—*Prestwood Sanatorium*. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Swansea.—*Adelina Patti Tuberculosis Hospital*, "Craig-y-nos," Pen-y-cae. Res. Med. Supt., Dr. F. Wells. Craig-y-nos, 2 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 miles. *See also Advt., p. 70*

Torquay.—*"Whitecliff" Tuberculosis Hospital*. Med. Supt., Dr. Rutherford Adams. Tuberculosis Off., Dr. E. Ward. Torre station, 2 miles.

Ulverston.—*High Carley Sanatorium* (including *Oubas House Children's Sanatorium*). Res. Med. Supt., E. H. A. Pask, M.D. Ulverston, 2 miles.

Ware (Herts).—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary.

Whiteabbey (Co. Antrim).—*Belfast Municipal Sanatorium*. Res. Med. Supt., P. S. Walker, M.D., B.Ch., D.P.H.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Senr. Res. Med. Off., Dr. Chas. E. Redman. Limpley Stoke station, 1 mile.

Worcester (near).—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, G.W.R., 1½ miles.

HYDROPATHIC ESTABLISHMENTS.

Baslow (Derbyshire).—*Grand Hotel and Hydro*. Man., A. Skelsey. Bakewell, 4 miles; Grindleford, 5 miles.

Ben Rhydding (Yorkshire).—*Ben Rhydding Hydro*. Res. Phys., G. Cooper, M.D. Station, 5 minutes.

Bournemouth (Hampshire).—*Bournemouth Hydro*. Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station, ¼ mile.

Bristol.—*The Bristol Hydro*. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S., and A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Temple Meads, 1½ miles.

Buxton.—*Buxton Hydro Hotel*. Manager, G. W. Bosworth. Station, 4 minutes. *See also Advt., p. 84*

Cork.—*St. Ann's Hill Hydro*. Res. Phys., Dr. R. H. Barter. Blarney, 2½; Cork, 8 miles. *See also Advt., p. 80*

Crieff.—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Eastbourne.—*Eastbourne Hydro Hotel*. Eastbourne, L.B. & S.C.R., 1 mile. Man., W. W. Hornsby.

Forres.—*Cluny Hill Hydro*. Vis. Phys., Dr. John C. Adam. Forres station, 1 mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro*. Manageress, Miss Oakley. *The Harrogate Hydro*. Res. Med. Supt., W. Taylor. Harrogate station, ¼ mile.

Hexham (Northumberland).—*Hexham Hydro*. Hexham, 1 mile.

Ilkley (Yorkshire).—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). See also Advt., p. 85

Limpley Stoke (near Bath).—*West of England Hydropathic.* Apply, the Secretary. Limpley Stoke station.

Malvern.—*The Malvern Hydro Lim.* Phys., Dr. H. Cavendish Fuller. Great Malvern, $\frac{1}{2}$ mile.

Wyche-side Hydropathic. Malvern. Malvern Wells station. G.W.R., $\frac{1}{2}$ mile; Great Malvern station, 2 miles.

Matlock.—*Rockside Hydropathic.* Matlock. Res. Med. Supt., Dr. Marie Goodwin-Orme, M.B.E. Man. Directors, Miss Goodwin and Mr. John G. Goodwin. Matlock, $\frac{1}{2}$ mile.

Smedley's Hydropathic. Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus. See also Advt., p. 83

Peebles.—*Peebles Hotel Hydropathic.* Resident Physician. L.M.S. and L. & N.E.R. stations, about 10 to 15 minutes' walk. See also Advt., p. 81

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. See also Advt., p. 86

Kenworthy's Hydropathic. Southport. Phys., Drs. A. B. and Irene E. Kenworthy. Chapel Street (L. & Y.); Lord Street (Cheshire Lines).

Tunbridge Wells.—*The Spa Hotel.* Station about 1 mile. Apply, Manageress. See also Advt., p. 86

Ulverston.—*Conishead Priory Hydropathic.* Res. Phys., John Wishart, M.D., D.Sc. Ulverston station, 2 miles.

Watford (Herts.).—*The Stanboroughs Hydropathic Institution.* Res. Physician. Watford Junc., L.M.S.R.

See also Advt. p. 84

NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

London.—*Cavendish Temperance Male Nurses' Corporation Lim.*, 43, New Cavendish St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester.

See also Advt., p. 64

London Temperance Male and Female Nurses Co-operation, 32, Princess Road, Kilburn, N.W.6. Sec., J. Preece.

See also Advt., p. 65

Male Nurses' Association, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks.

See also Advt., p. 63

New Mental Nurses' Co-operation, 139, Edgware Road, Marble Arch, W.

See also Advt., p. 64

St. Luke's Hospital. Trained Nurses for Mental and Nervous Cases. Lady Supt., 19, Nottingham Place, W. 1; also at 57, Clarendon Road, Leeds.

See also Advt., p. 62

Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Medical Gymnastics, Massage, and Electricity.

See also Advt., p. 65

The Nurses' Association, 29, York Street Baker Street, W. 1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 63

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles.

See also Advt., p. 67

Bad Godesberg a. Rh.—*Dr. R. Schorlemmer's Sanatorium.* For diseases of the stomach, etc.

See also Advt., p. 76

Bath.—*Lansdown Hospital and Nursing Home.* Bath. Special arrangements for patients suffering from gout, rheumatism, and physical infirmities. Physicians, Dr. Percy Wilde and Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile.

See also Advt., p. 62

Bexhill-on-Sea.—*Suffolk House.* Rest home for convalescents. Apply, Miss A. M. Adamson. Central station, 4 minutes.

See also Advt., p. 69

Colinsburgh, Fife.—*Kenlaw House.* Functional nervous diseases. Res. Phys., Dr. W. H. Bryce, Dr. E. Gleaves, and Dr. J. C. Young. Kilconquhar station, $\frac{1}{2}$ miles.

See also Advt., p. 66

Edinburgh.—*Queensberry Lodge*, Holyrood. For invalid and aged ladies requiring nursing. Med. Supt., Wm. Russell, M.D. Governor, Wm. Cloonan. Waverley station, $\frac{1}{2}$ mile.

See also Advt., p. 68

Hadlow Down, Uckfield (Sussex).—*South Beacon* (for gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harner. Station: Buxted. Brighton, 22 miles; Eastbourne, 19 miles; Tunbridge Wells, 13 miles.

See also Advt., p. 66

Harrogate.—*Clovelly Nursing Home*, Clarence Drive. Rest cure, convalescent, medical and surgical cases. Lady Supt., Miss M. B. Bewsher.

See also Advt., p. 61

Haslemere (Surrey).—*Haslemere Nursing Home*, "Courtsfold". Medical and maternity cases, convalescents, rest cures. Apply, Miss Walker. Haslemere (S. Rly.), $\frac{3}{4}$ mile.

See also Advt., p. 66

Jersey.—*Sans Souci*, Anne Port, Gorey Village. Neurasthenic Convalescent Home. Matron, Mrs. Macdonald. Gorey, 1 mile.

See also Advt., p. 90

London.—*The Radium Institute*, 16, Riding House Street, W. Med. Supt., A. E. Hayward Pinch, F.R.C.S.

See also Advt., p. 79

Ruthin, North Wales.—*Ruthin Castle*. Private Hospital for Internal Diseases.

See also Advt., p. lvii

Stillington, near York.—*Wellington House*. Medical and Nerve cases. Apply, Nurses Maskill and Newnan.

See also Advt., p. 66

Torquay.—*Ockenden Convalescent Home*. Med. Supt., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torrey and Torquay stations, 1 mile.

See also Advt., p. 69

Watford (Herts.).—*The Stanboroughs*. Medical and Surgical cases. Res. Physician. Watford Junc., L.M.S.R.

See also Advt., p. 84

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION,

Comprising the Spas of BATH, BUXTON, CHELTENHAM, DROITWICH, HARROGATE, LEAMINGTON, LLANDRINDOD WELLS, STRATHPEFFER, WOODHALL, and NEW ZEALAND.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Climate mild and equable. Bath is at its busiest in the autumn, winter, and spring months, but has an all-the-year-round season. A winter spa is of priceless value to any country, especially to such a country as Britain where, during the winter months, rheumatism in all its forms is particularly prevalent. During the summer there are some complaints in which Bath proves most efficacious.

Waters.—The only hot springs in Britain (120° F.) and the richest natural radio-active mineral waters in this country.

Therapeutic indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions. A detailed list of complaints successfully treated will be sent on application.

Baths.—An extensive and thoroughly equipped bathing establishment. The Queen's Baths and the Old Royal Baths, the Royal Baths (opened 1916) and the New Wing (opened 1919) provide the latest and most approved balneo-therapeutic methods.

Bath specializes in the treatments for which its waters are particularly adapted: deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation. Particulars of the many other treatments given will be sent on request by John Hutton, Director of the Spa.

Hotel.—The Pulteney Hotel (*see p. 87*).

Nursing and Baths.—Lansdown Hospital and Nursing Home (*see p. 62*).

(*See also p. 1.*)

Buxton (Derbyshire).—1000 to 1200 feet above sea-level. The highest town in the United Kingdom; 163 miles from London; 23 miles from Manchester. Served by the London, Midland and Scottish Railway. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless. Chalybeate springs.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, muco-membranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized at great cost. Open all the year round. All the latest equipment installed.

Medical Profession, etc.—Complimentary facilities granted to practising medical men.

Hydropathic Establishment.—Buxton Hydro Hotel (*see p. 84*).

Boarding Establishment.—The Buckingham (*see p. 82*).

(*See also p. 1.*)

Cheltenham (Gloucestershire).—Protected from N. and N.E. winds by the Cotswold Hills; 184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 26 inches. Sunshine 1488 hours.

Waters.—Of four kinds: the Fieldholme or twin salt saline, containing nearly equal parts of magnesium sulphate and sodium sulphate—sold in bottles by chemists, under the name of "Chelspa," aperient water; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium, closely resembling Kissingen waters; the Pittville or alkaline saline, the only alkaline natural water in Great Britain, very similar in analysis to Carlsbad or Marienbad waters; and the Chadnor or magnesium and calcium saline, containing a large quantity of sulphate of magnesium and a considerable amount of carbonate and sulphate of calcium.

Therapeutic indications.—The Fieldholme water is most useful in gastric hyperacidity, sthenic dyspepsia, obesity, plethora, chronic constipation, hemorrhoidal conditions, and glycosuria associated with obesity; Lansdown water for anæmic dyspeptics, skin affections, and chronic gastric catarrh; Pittville water for congestion of the liver, torpid liver, biliary catarrh, gastroduodenal catarrh, and gall-stones, also for mucous colitis, toxæmia, glycosuria, and catarrhal conditions of the intestinal tract; and Chadnor water for renal disorders, lumbago, myalgia, torticollis, and other forms of fibrositis.

Baths.—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa. All the latest baths and treatment.

(*See also p. li.*)

Droitwich Spa (Worcestershire).—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 27 inches. Mean winter temperature 44° F., summer 65° F. The climate is excellent for invalids both in summer and winter. Moderately bracing, but well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 times the strength of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of other European waters: the waters are radio-active and radio-emanative.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar and equal to Nauheim treatment, or the Nauheim treatment, on the most approved principles, is given if prescribed—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis. Moist eczema is contra-indicated.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotels.—Raven and Park Hotels (*see p. 84*); Worcestershire Brine Baths Hotel (*see p. 85*).

(*See also p. li.*)

Harrogate (Yorkshire).—450–600 feet above sea level, 203 miles from London. Unequalled by any Continental spa. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 29 inches. Mean temperature 46° F.

Waters.—Celebrated for the medicinal properties of its 87 springs—sulphurous, chalybeate, alkaline, and saline. 'Aquaperia' aperient mineral water is bottled from a Spring at Harrogate by Camwal Ltd. (*See p. 159.*)

Therapeutic indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anæmia, nervous diseases, hyperpiesis, and the sequelæ of tropical diseases.

Baths.—There are five establishments, where nearly 100 treatments are given, including all the Continental systems and others. The staff of 200 are all medically trained and certificated, as also are the masseurs. The waters are continually under scientific control by the highly qualified scientific officer on the permanent staff. Harrogate also possesses its own pathologist and bacteriologist, X-ray expert, etc.

The surrounding country is unsurpassed for beauty and interest, and the amusements and recreations are of the highest order.

Nursing.—Clovelly Nursing Home (*see p. 61*).

(*See also p. lii.*)

Leamington Spa (Warwickshire).—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 24 inches. Mean annual temperature 49°50'. Westerly winds prevail.

Waters.—Radio-active saline springs, resembling those of Homburg, but more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, saline, Plombières, paraffin wax, Berthollet, and electric of all kinds. Swimming baths. (See also p. lii.)

Llandrindod Wells (Radnorshire).—Situating amidst beautiful mountain and river scenery in Mid-Wales at an altitude of 750 feet above sea-level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 35 inches. About 204 miles distant from London on the main L.M. & S. Railway, about mid-way between Shrewsbury and Swansea.

Waters.—Celebrated for the variety and efficacy of its numerous medicinal springs. Saline, sulphur and radium-sulphur, magnesium, lithia saline and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia or debility from overwork.

Baths.—Sulphur, immersion, needle and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; almost every known form of electrical treatment by fully qualified staff.

Hotel.—Ye Wells Hotel (see p. 87).

(See also p. liii.)

Strathpeffer Spa (Ross-shire, N.B.).—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

(See also p. liii.)

Woodhall Spa (Lincolnshire).—50 feet above sea level. 124 miles from London. Average rainfall 22½ inches. The air, bracing and uncontaminated, sweeping across the Lincolnshire wolds from the sea, is soothing and curative, bringing restful sleep to jaded nerves. The quiet simplicity of Woodhall Spa is in itself a distinction.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders. Not only is Woodhall Spa the place to visit in cases of rheumatism, gout, or any of the diseases mentioned; but those who are suffering from overwork and nerve-strain will find it a delightful holiday resort.

Spa Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Sehnee baths; Dowsing radiant heat and light baths; Bergonié treatment; nose, throat, and eye mineral sprays and douches; Russian and Berthollet vapour; electric, ionic, and X-ray treatments; paraffin-wax treatment; massage and Swedish exercises. There are 60 acres of grounds surrounding the Pump Room. Particulars, apply Secretary.

Hotel.—Spa Hotel (see p. 84).

(See also p. liv.)

New Zealand Spas.—The mineral waters of New Zealand are famed both for their great variety and for their powerful therapeutic properties. Many of them are almost unique: quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than most Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of sulphur waters of two main types: alkaline sulphur,

containing sodium chloride, bicarbonate, and silicate: and acid sulphur, containing sulphuric acid, and used for baths only. There are mud baths supplied from the *boiling mud springs*, corresponding to the fango treatment of Italy, and natural vapour baths. The massage and electrical department is thoroughly up to date. The whole establishment is under Government management, and skilled medical attendance is provided.

Climate and Season.—The latitude corresponds to that of the south of Spain, but the spa being 1000 ft. up, the climate is by no means hot. Season from October to May, but baths open all the year round.

Accommodation.—Several hotels and numerous boarding houses.

Access by train from Auckland or Wellington.

TE AROHA.—Hot *alkaline waters* of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative

Accommodation.—Several hotels and boarding houses.

Access by train, branch from Rotorua line.

HANMER.—In the South Island: has mild sulphur baths and a bracing climate.

(See also p. liv.)

OTHER BRITISH SPAS.

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 33 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic indications.—Specially the 'open-air' cure of neurasthenia, for sequelae of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from over-work, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe. 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 37 inches. Mean annual temperature 48° F. Bracing and invigorating moorland air.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (see p. 85).

Langammarch Wells (Breconsire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium ($6\frac{1}{2}$ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia. (See also p. 69.)

Hotel.—Lake Hotel (see p. 69).

Malvern (Worcestershire).—520 feet above sea level. A health centre of long repute, 122 miles from London. Rapid train service from all parts by G.W.R. and L.M.S.R. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 27 inches. Mean temperature about 49° F. Exceptional sunshine records. Set amidst a ten-mile range of hills with unrivalled views.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. 'Malvernian' Alkaline Table Water is bottled by W. & J. Burrow Ltd. (see p. 152).

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths and Treatments.—Natural brine, Turkish and electric baths. Vichy massage and Aix douches, and every Spa treatment under competent direction.

Matlock Bath (Derbyshire).—300 to 800 feet above sea level, 143 miles from London. Average rainfall 36 inches. Mean temperature about 47° F. Very sheltered.

Waters.—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Matlock Bank (Matlock station, one mile by rail from Matlock Bath).—South-westerly aspect, and well sheltered from the north. 144 miles from London. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, dowsing radiant heat and light, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

Hydropathic Establishment.—Smedley's Hydropathic (see p. 83).

Peebles (Peeblesshire, N.B.).—About 500-600 ft. above sea level. One hour from Edinburgh and 382 miles from London. Rainfall, 27 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic indications.—The waters are specially suited to the Nauheim or Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (see p. 81).

Torquay (Devonshire).—199½ miles from London. Non-stop express trains run daily, the journey occupying only 3½ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. During 1925 there were 1,822.02 hours of sunshine. A very notable feature is the large average of winter sunshine. During the winter months the mean temperature is 44.6°.

Climate.—Mild, soft and equable. It is specially beneficial for many pulmonary, bronchial and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. Average rainfall about 33 inches. The season is all the year round.

Baths.—The medical baths are very modern and complete. They are ideally situated. All British and Continental spa treatments are available. A trained and skilled staff is always in attendance. Medical consultation rooms have been opened for the convenience of medical practitioners and patients. There is a large tepid sea-water swimming bath. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout.

(See also p. xlix.)

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths. The waters are also supplied for home treatment in hermetically sealed phials, a special feature of this Spa.

Therapeutic indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

(See also p. 82.)

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W.

Waters.—A weak non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

Hotel.—The Spa Hotel (see p. 85).

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(1) The Vaccination Stations enumerated in the subjoined list are open, under certain specified conditions, for the purposes of Teaching and Examination;

(2) The Vaccinators officiating at these Stations are authorized to give the required Certificates of Proficiency in Vaccination to persons whom they have sufficiently instructed therein;

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	St. Bartholomew's Hospital and College	George Cuthbert Nelson Younger, M.R.C.S. ..	First three Weds. at 11.30; followed by practical instruction beginning 2nd Tues. at 2.30 (beginning Jan., April and Oct.)
	London Hospital Medical College, E.C.1.	Ditto.	
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 1, Hanover H'se, St. John's Wood, N.W.8	Fri.; 3 (beginning in Feb. May & Nov.)
	St. John's Vestry Hall, 9, Fair St., S.E.1.	V. A. Jaynes, M.R.C.S., 157, Jamaica Road, Ber- mondsey, S.E.16	Wednesday; 2 (except August)
	Royal Free Hospital, Gray's Inn Road, W.C.1	Miss G. Dearnley, M.D., 27, Seymour House, Comp- ton St., W.C.1	Thursday; 10.15
Birmingham	144, Hockley Hill	W. H. Line, M.D.,	*
Bristol	General Hospital	J. A. Birrell, M.D.,	*
Cambridge	Addenbrooke's Hospital	Dr. F. Deighton, Hills Road	*
Leeds	Leeds General Infirmary	Dr. F. W. M. Greaves, Stur- die House, Roundhay Rd.	Thurs.; 3 (Oct., Nov., Feb., Mar., May, June)
Liverpool	The School of Hygiene ..	W. Hanna, M.D., Dale St.	*
Manchester	Chorlton Dispensary ..	Dr. Catherine Chisholm, .. 78, King Street	*
Newcastle-upon- Tyne	The Dispensary, Nelson St.	<i>F. Hawthorn, D.S.O., M.D.</i> 10, Ellison Place	*
Sheffield	Jessop Hospital for Women	John Chisholm, F.R.C.S. 283, Glossop Road.	*
Cardiff	City Hall	Dr. J. J. Buist, 50, Park Place	Tuesday
Aberdeen	The Public Dispensary ..	Dr. John Brown, Hamilton Lodge, Aberdeen	Wednesday; 3. (during med. sess.)
Dundee	Infant Welfare Centre, 23, Victoria Road	Dr. D. H. Scott, 55, Magdalen Yard Road	Friday; 4
Edinburgh	Marshall Street Dispensary	W. D. D. Small, M.D., .. 50, Moray Place	Sat.; 12
	The Royal Public Dispensary Richmond Street	Dr. R. Aitken, 8, Palmerston Place	Sat.; 12 (during med. sess.)
	Livingstone Memorial Disp.	Dr. J. Young,	Tuesday; 3
	New Town Dispensary ..	2, Mayfield Gardens	Wednesday; 3
Glasgow	Western Dispensary ..	.. ..	Thursday; 3
	The Royal Infirmary ..	Dr. H. H. Borland, .. 41, Circus Drive, Dennistoun	Monday; 12 (Men) Thurs.; 12 (Women) (during med. sess.)
	The Western Infirmary ..	J. L. Carstairs, M.A., M.B. 6, Sardinia Terrace	Mon. & Thurs.; 12
Belfast	City of Belfast Union Infirm.	Dr. J. McLiesh, 91, Great Victoria Street	Wednesday; 11
Cork	Cork District Hospital ..	Dr. P. T. O'Sullivan, .. 20, South Mall	*
Dublin	45, Upper Sackville Street ..	<i>Dr. A. N. Montgomery,</i> 45, Upper Sackville Street	Tues., Fri.; 11.30 (beginning in Jan., April and Oct.)
Galway	The Dispensary	Dr. M. J. McDonough, .. Flood Street	*

(a) Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction. * Days and hours arranged each Session.

MEDICAL AND SCIENTIFIC SOCIETIES.

- Abernethian Society—St. Bartholomew's Hospital, E.C.1.
 Æsculapian Society—Metropolitan Hospital, Kingsland Road, E.8.
 Anatomical Society of Great Britain and Ireland—Secretary, E. Barclay-Smith, M.D., Park Lodge, Hervey Road, Blackheath, S.E.
 Association of British Postal Medical Officers—Sec., 206, Mansfield Road, Nottingham.
 Association of Physicians of Great Britain and Ireland—Secretary, H. M. Fletcher, M.D., 98, Harley Street, W.1.
 Association of Public Vaccinators of England and Wales—22, Panmuir Road, S.W.20.
 Association of Scottish Medical Diplomates—Hon. Sec., 11, Chandos Street, W.1.
 Association of Surgeons of Great Britain and Ireland—Sec., C. H. S. Frankau, C.B.E., D.S.O., 51, Wimpole Street, W.1.
 Assurance Medical Society—Sec., H. W. Collier, M.D., 8, Princes Street, E.C.2.
 British Association for the Advancement of Radiology and Physiotherapy—Hon. Secretaries, 12, Stratford Place, W.1.
 British Association for the Advancement of Science—Burlington House, W.1.
 British Dental Association—Secretary, 23, Russell Square, W.C.1.
 British Homœopathic Association (Incorporated)—43, Russell Square, W.C.1.
 British Medical Association—Secretary, B.M.A. House, Tavistock Square, W.C.1.
 British Medical Protection Society Lim.—132, Great Portland Street, W.1.
 British Optical Association—Sec., Clifford's Inn Hall, E.C.4.
 British Orthopædic Association—Sec., R. C. Elnslie, M.S., 1A, Portland Place, W.1.
 British Social Hygiene Council (Incorporated)—Carteret House, Carteret Street, W.1.
 British Society of Dental Surgeons—Sec., 11, Chandos Street, W.1.
 Chelsea Clinical Society—Sec., 48, Queen Anne Street, W.1.
 Clinical Research Association Lim.—Watergate House, York Buildings, Adelphi, W.C.2. (See *Advertisement*.)
 Cremation Society of England—52, New Cavendish Street, W.1.
 Epsom College (Royal Medical Foundation)—Sec., 49, Bedford Square, W.C.1.
 Federation of Medical and Allied Services (Incorporated)—12, Stratford Place, W.1.
 Guild of St. Luke—Hon. Sec., Chaplain's House, Banstead Downs, Sutton, Surrey.
 Harveian Society of London—Sec., W. G. Bendle, F.R.C.S., Paddington Hospital, 285, Harrow Road, W.9.
 Hospital Saturday Fund—Sec., 54, Gray's Inn Road, W.C.1.
 Hunterian Society—Sec., 81, Wimpole Street, W.1.
 Imperial Cancer Research Fund—Examination Hall, 8-11, Queen Square, W.C.1.
 Infirmary Medical Superintendents' Society—Sec., R. C. Harkness, F.R.C.S., Bermondsey and Rotherhithe Hospital, S.E.16.
 Institute of Hygiene—Sec., A. S. Harding, 28, Portland Place, W.1.
 Irish Medical Association—Sec., 28, Molesworth Street, Dublin.
 Irish Medical Schools and Graduates' Association—Sec., 11, Chandos Street, W.1.
 Listerian Society—King's College Hospital, S.E.5.
 London and Counties Medical Protection Society Lim.—Secs., Hugh Woods, M.D., and A. G. R. Foulerton, O.B.E., F.R.C.S., Victory House, Leicester Square, W.C.2.
 London Association of Medical Women—Sec., Miss K. Platt, 59, Queen Anne Street, W.1.
 London Dermatological Society—49, Leicester Square, W.C.2.
 London Hospital Medical Society—London Hospital, Mile End, E.1.
 Medical Abstiners' Association—Sec., Dr. C. C. Weeks, 55, Paternoster House, E.C.4.
 Medical Defence Union Lim.—Sec., Dr. James Neal, 49, Bedford Square, W.C.1.
 Medical Officers of Schools' Association—Sec., 11, Chandos Street, W.1.
 Medical Practitioners' Union—Sec., 56, Russell Square, W.C.1.
 Medical Sickness, Annuity and Life Assurance Society Lim.—300, High Holborn, W.C.1.
 Medical Society for the Study of Venereal Diseases—Sec., 43, Queen Anne Street, W.1.
 Medical Society of London—11, Chandos Street, W.1.
 Medical Women's Federation—Sec., Miss M. Rew, 9, Clifford Street, W.1.
 Medico-Legal Society—11, Chandos Street, W.1.
 Metropolitan Police Surgeons' Association—Hon. Sec., 174A, Boyson Road, S.E.17.
 Middlesex Hospital Cancer Research Department—Nassau Street, W.1.
 Middlesex Hospital Medical Society—Hon. Sec., Mortimer Street, W.1.
 National Association for the Prevention of Tuberculosis—20, Hanover Square, W.1.
 National Medical Union—11, Chandos Street, W.1.
 Ophthalmological Society of the United Kingdom—1, Wimpole Street, W.1.
 Pathological Society of Great Britain and Ireland—Sec., University of Cambridge.
 Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.1.
 Physiological Society—Sec., H. E. Roaf, M.D., London Hospital Medical College, E.1.
 Poor Law Medical Officers' Association of England and Wales—2, Finsbury Sq., E.C.2.
 Research Defence Society—11, Chandos Street, W.1.
 Röntgen Society—Hon. Sec., Dr. R. J. Reynolds, 36, Harley Street, W.1.

Royal Institute of Public Health—37, Russell Square, W.C.1.
 Royal Medical Benevolent Fund—11, Chandos Street, W.1.
 Royal Medico-Psychological Association—11, Chandos Street, W.1.
 Royal Sanitary Institute, and Parkes Museum—90, Buckingham Palace Road, S.W.1.
 Royal Society of London—Burlington House, Piccadilly, W.1.
 Royal Society of Medicine—1, Wimpole Street, W.1, incorporated by Royal Charter, 1834, and Supplemental Charter, 1907, and embracing the following Sections—
 Anæsthetics—Bæneology and Climatologv—Children's Diseases—Clinical—Comparative Medicine—Dermatology—Electro-therapeutics—Epidemiology and State Medicine—Historical—Laryngology—Medicine—Neurology—Obstetrics and Gynaecology—Odontology—Ophthalmology—Orthopædics—Otology—Pathology—Psychiatry—Surgery (with sub-section of Proctology)—Therapeutics and Pharmacology—Tropical Diseases and Parasitology—Urology—War Section.
 Royal Society of Tropical Medicine and Hygiene—11, Chandos Street, W.1.
 St. Thomas's Hospital Medical and Physical Society—St. Thomas's Hospital, S.E.1.
 Society for the Prevention of Venereal Disease—Hon. Sec., 143, Harley Street, W.1.
 Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.1.
 Society for the Study of Inebriety—Hon. Sec., 19, Park Crescent, Portland Place, W.1.
 Society of Medical Officers of Health—1, Upper Montague Street, W.C.1.
 Society of Members of the Royal College of Surgeons of England—Sec., S. C. Lawrence, M.B., M.R.C.S., 106, Richmond Park Road, Bournemouth.
 Society of Superintendents of Tuberculosis Institutions—Hon. Sec., Dr. J. R. Dingley, Darwell Hall Sanatorium, Robertsbridge, Sussex.
 Tuberculosis Society—Sec., 138, Herbert Road, Woolwich, S.E.18.
 Wellcome Historical Medical Museum—54a, Wigmore Street, W.1.
 West Kent Medico-Chirurgical Society—Hon. Sec., Dr. C. J. B. Buchan, 326, Brownhill Road, Catford, S.E.6.
 West London Medico-Chirurgical Society—West London Hospital, W.6.

MEDICAL AND SCIENTIFIC PERIODICALS, Etc.

Anæsthesia, British Journal of—Quarterly, 40/- per annum—Sherratt & Hughes, 34, Cross Street, Manchester.
 Analyst—Monthly 3/-; 30/- per annum—W. Heffer & Sons, Cambridge.
 Anatomy, Journal of—Quarterly, 40/- per annum—Cambridge University Press, Fetter Lane, E.C.4.
 Annals of Clinical Medicine—Monthly 5/- —8, Henrietta Street, W.C.2.
 Annals of Medical History—Quarterly, 42/- per annum—8, Henrietta Street, W.C.2.
 Annals of Surgery—Monthly 4/6—Cassell & Co. Lim., La Belle Sauvage, E.C.4.
 Annuaire Médical de Grèce—Yearly 10/-—Assael & Mazza, Athens. (*See Advertisement.*)
 Antiseptic, The—Monthly, 10/- per annum—323, Thambu Chetti Street, Madras. (*See Advertisement.*)
 Archives of Medical Hydrology—Three times yearly, at 4/- each—36, Devonshire Place, W.1.
 Archives of Occupational Therapy—Yearly 5/-; 27/6 vol.—8, Henrietta St., W.C.2.
 Bacteriology, Abstracts of—Monthly 3/6—8, Henrietta Street, W.C.2.
 Bacteriology, Journal of—Yearly 5/-, or 27/6 per vol.—8, Henrietta Street, W.C.2.
 Birmingham Medical Review—Monthly, 13/6 per annum—Cornish Bros. Lim., 39, New Street, Birmingham.
 Brain—Quarterly 6/-; 24/- per annum—Macmillan, St. Martin's Street, W.C.2.
 Bristol Medico-Chirurgical Journal—Quarterly 3/-; 10/6 per annum—J. W. Arrow-smith Ltd., Bristol. (*See Advertisement.*)
 British Food Journal and Hygienic Review—Monthly 9d.; 10/6 per annum—22, Northumberland Avenue, W.C.2.
 British Journal of Experimental Pathology—Six times per annum for 40/- —Lewis, 28, Gower Place, W.C.1.
 British Medical Journal—Weekly 1/3—B.M.A. House, Tavistock Square, W.C.1.
 Burdett's Hospitals and Charities—Yearly—24, Russell Square, W.C.1.
 Caledonian Medical Journal—Quarterly 1/6—70, Mitchell Street, Glasgow.
 Cambridge University Medical Society's Magazine—Three times yearly, 5/- per annum —4, Petty Cury, Cambridge.
 Cancer, Journal of—Quarterly 2/6; 10/6 per annum—Crow Street, Dublin.
 Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.C.2.
 Child, The—Monthly 2/-; 21/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Childhood, Archives of Disease in—Six times a year, 25/- per annum—British Medical Association, B.M.A. House, Tavistock Square, W.C.1.

- Children's Diseases, British Journal of—Quarterly 7/6; 25/- per annum—Adlard & Son and West Newman Ltd., 23, Bartholomew Close, E.C.1.
- Clinical Journal—Weekly 6d.; 26/- per annum—Lewis, 28, Gower Place, W.C.1.
- Clinical Research, Journal of—Quarterly, free to members of Association—Watergate House, York Buildings, Adelphi, W.C.2. (*See Advertisement.*)
- Dental Journal, British—1st and 15th, 1/-; 25/- per annum—23, Russell Square, W.C.1.
- Dental Record—Monthly 1/-; 10/6 per annum—Alston House, Newman Street, W.1.
- Dental Science, British Journal of—Monthly 1/-; 10/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Dental Surgeon—Weekly 4½d.; 20/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- Dental Surgeons' Directory—Yearly 8/6 net—7, Great Marlborough Street, W.1.
- Dentists' Register—Yearly 12/-—Constable, 10, Orange Street, W.C.2.
- Dermatology and Syphilis, British Journal of—Monthly 4/-; 42/- per annum—H. K. Lewis & Co. Lim., 28, Gower Place, W.C.1.
- Edinburgh Medical Journal—Monthly 4/- net; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
- Franco-British Medical Review—Monthly 1/-—83-91, Great Titchfield Street, W.1.
- Glasgow Medical Journal—Monthly 3/-; 30/- per annum—70, Mitchell Street, Glasgow.
- Guy's Hospital Gazette—Fortnightly 9d.; 10/- per annum—Ash & Co. Lim., Henry Street, Bermondsey Street, S.E.1.
- Heart: A Journal for the Study of the Circulation—Quarterly, 37/6 per annum—Shaw & Sons, Lim., 7, Fetter Lane, E.C.4.
- Helminthology, Journal of—Five times yearly, 25/- vol.—23, Endsleigh Gardens, N.W.1.
- Homœopathic Journal, British—Quarterly 3/6—Bale, 83-91, Gt. Titchfield Street, W.1.
- Homœopathic World—Monthly 6d.—12A, Warwick Lane, E.C.4.
- Hygiene, Journal of—Quarterly 12/6—Cambridge University Press, Fetter Lane, E.C.4.
- Indian Journal of Medical Research—Quarterly, Rs. 16 per annum—Thacker, Spink & Co., Calcutta.
- Indian Medical Gazette—Monthly, Rs. 16 per annum—Thacker & Co.; 2, Creed Lane, E.C.4. (*See Advertisement.*)
- Inebriety, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2.
- Irish Journal of Medical Science (Official Organ of the Royal Academy of Medicine in Ireland)—Monthly 2/6—Parkgate Printing Works, Dublin. (*See Advertisement.*)
- Journal of Clinical Investigation—Yearly 5/-; 27/6 vol.—8, Henrietta Street, W.C.2.
- Journal of Comparative Psychology—Twice monthly, 5/-—8, Henrietta Street, W.C.2.
- Journal of Immunology—Twice monthly, 5/-—8, Henrietta Street, W.C.2.
- Lancet—Weekly 1/-; 42/- per annum—423, Strand, W.C.2. (*See Advertisement.*)
- Laryngology and Otology, Journal of—Monthly 4/-; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
- Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- London Hospital Gazette—Monthly 1/-; 10/- per annum—5, Rupert Street, E.1.
- Massage and Medical Gymnastics, Journal of the Chartered Society of—Monthly 6d.—157, Great Portland Street, W.1.
- Masseuses and Masseurs, Register of—Yearly 3/6—157, Great Portland Street, W.1.
- Maternity and Child Welfare—Monthly 1/-; 10/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Medical Annual—Yearly 20/- net; Subscribers before publication 17/- net, post free—John Wright & Sons Lim., Bristol.
- Medical Directory—Yearly 30/- net—Churchill, 7, Great Marlborough Street, W.1.
- Medical Officer—Weekly 1/-; 42/- per annum (and Supplement monthly: The Jennerian)—36-38, Whitefriars Street, E.C.4. (*See Advertisement.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—A. A. Tindall, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.
- Medical Review—Monthly 2/6; 30/- per annum—70, Finsbury Pavement, E.C.2.
- Medical Temperance Review—Quarterly 6d.—23, Bartholomew Close, E.C.1.
- Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.
- Medical Who's Who—Yearly 30/-—Grafton Publishing Co. Lim., 8, Stone Buildings, Lincoln's Inn, W.C.2. (*See Advertisement.*)
- Medical Women's International Journal—Twice yearly—24, Old Jewry, E.C.2.
- Medical World—Weekly 1/-; 52/- per annum—56, Russell Square, W.C.1.
- Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.
- Medical and Nursing Homes Directory—Yearly 9d.—24, Russell Square, W.C.1.
- Medicine—Quarterly 7/6—8, Henrietta Street, W.C.2.
- Mental Science, Journal of—Quarterly 7/6—7, Great Marlborough Street, W.1.
- Middlesex Hospital Journal—Six issues, 1/- each—Middlesex Hospital, W.1.
- Midwives' Roll—Yearly 42/-—Spottiswoode, 1, New Street Square, E.C.4.
- Mind—Quarterly 4/6; 16/- per annum—Macmillan, St. Martin's Street, W.C.2.
- Municipal Engineering and Sanitary Record—Weekly 4d.—8, Bream's Buildings, E.C.4.

- National Medical Journal—National Medical Union, 11, Chandos Street, W.1.
 Neurology and Psychiatry, Review of—30/- per annum—91, Great Russell Street, W.C.1.
 Neurology and Psychopathology, Journal of—Quarterly 8/6 net; 30/- per annum—Wm. Heinemann Ltd., 20, Bedford Street, W.C.2.
 Obstetrics and Gynaecology of the British Empire, Journal of—Quarterly 12/6—34 Cross Street, Manchester.
 Ophthalmology, British Journal of—Monthly 5/-; 42/- per annum—Pulman & Sons Lim., 24, Thayer Street, W.1.
 Parasitology—Quarterly 15/-—Cambridge University Press, Fetter Lane, E.C.4.
 Pathology and Bacteriology, Journal of—Quarterly, 40/- per annum—Oliver & Boyd, Edinburgh.
 Pharmacology and Experimental Therapeutics, Journal of—Monthly 7/6—8, Henrietta Street, W.C.2.
 Physiological Abstracts—Monthly, 42/- per annum—28, Gower Place, W.C.1.
 Physiology (Experimental), Quarterly Journal of—40/- per volume—Chas. Griffin & Co. Lim., 42, Drury Lane, W.C.2.
 Physiology, Journal of—Quarterly, 30/- per volume—Fetter Lane, E.C.4.
 Post-Graduate Medical Journal—Monthly 6d.—1, Bedford Street, W.C.2.
 Practitioner—Monthly 4/-; 42/- per annum—2, Howard Street, Strand, W.C.2.
 Prescriber—Monthly 2/-; 20/- per annum—6, South Charlotte Street, Edinburgh. (See *Advertisement*.)
 Psycho-analysis, International Journal of—Quarterly, 30/- per vol.—8, Henrietta Street, W.C.2.
 Psychology, British Journal of—Quarterly (Medical Section), 30/-; (General Section), 30/- net per volume—Cambridge University Press, Fetter Lane, E.C.4.
 Public Health—Monthly 2/6; 31/6 per annum—1, Upper Montague Street, W.C.1.
 Quarterly Journal of Medicine—Quarterly 10/6; 35/- per annum—Oxford University Press, Amen Corner, E.C.4.
 Radiology, British Journal of—Monthly 4/-; 42/- per annum—Wm. Heinemann Ltd., 20, Bedford Street, W.C.2.
 Röntgen Society, Journal of the—Quarterly 5/- net; 20/- per annum—Percy Lund, Humphries & Co. Lim., 3, Amen Corner, E.C.4.
 R.A.M.C., Journal of the—Monthly 2/-—Bale, 83-91, Great Titchfield Street, W.1.
 Royal Naval Medical Service, Journal of the—Quarterly 6/- net; 20/- per annum—83-91, Great Titchfield Street, W.1.
 Royal Sanitary Institute, Journal of the—Monthly 1/-—12, Long Acre, W.C.2.
 Royal Society of Medicine, Proceedings of the—Monthly 10/6 net; 105/- per annum—Longmans, Green & Co., 39, Paternoster Row, E.C.4.
 St. Bartholomew's Hospital Journal—Monthly 9d.; 7/6 per annum—Students' Union, St. Bartholomew's Hospital, E.C.1.
 St. Bartholomew's Hospital Reports—Yearly 10/6—50A, Albemarle Street, W.1.
 St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield Street, W.1.
 St. Mary's Hospital Gazette—Monthly, 10/- per annum—187, Edgware Road, W.2.
 St. Thomas's Hospital Gazette—Six times per ann., 7/6—St. Thomas's Hospital, S.E.1.
 St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.1.
 School Hygiene—Quarterly 1/6—23, Bartholomew Close, E.C.1.
 Serpent, The—3/6 per annum—University Union, Manchester.
 South African Medical Record—Fortnightly 1/3; 31/6 per annum—Baillière, 8, Henrietta Street, W.C.2.
 State Medicine, Journal of—Monthly 2/-—37, Russell Square, W.C.1.
 Surgery, British Journal of—Quarterly 12/6 net; 42/- per annum—John Wright & Sons Lim., Bristol. (See *Advertisement*.)
 Surgery, Gynecology, and Obstetrics, and International Abstract of Surgery—Monthly 7/6; 75/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Tropical Diseases Bulletin—Monthly 2/6; 25/- per ann.—23, Endsleigh Gardens, N.W.1.
 Tropical Medicine and Hygiene, Journal of—Fortnightly 1/6; 30/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Tropical Medicine and Parasitology, Annals of—Quarterly 7/6; 22/6 per annum—177, Brownlow Hill, Liverpool.
 Tubercle—Monthly 2/6; 25/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Tuberculosis, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2. (See *Advertisement*.)
 University College Hospital Magazine—Oct. to March, 7/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Urology, Journal of—Monthly 3/6—8, Henrietta Street, W.C.2.
 Venereal Diseases, The British Journal of—Quarterly 6/-; 20/- per annum—10-12, Orange Street, W.C.2.
 West London Medical Journal—Quarterly 2/-—83-91, Great Titchfield Street, W.1.

SELECTED MEDICAL TRADES DIRECTORY.

Artificial Eyes, Limbs and Orthopædic Appliances.

- Braid, A. E. & Co. Lim., 30, Gower Place,
Gower Street, W.C.1
Critchley, J. & Sons, Liverpool
Eades, William E., 12, Lower Park Row,
Bristol
Grossmith, W. R. Lim., 12, Burleigh St.,
Strand, W.C.2
Halford, Wm., Senr., 41, Upper Tollington
Park, N.4, and 3, Upper Gloucester
Place, W.1 (Eyes)
Haywood, J. H. Lim., Nottingham
Hill, W. & Co., 70 & 72, Chancery Lane,
W.C.2
Masters, M. & Sons Lim., 240, New Kent
Road, S.E.1
Pache & Son, 75, Station St., Birmingham
(Eyes)
Pearce, Allan, 98-100, Queen St., Cardiff
Salmon, Chas. & Sons, Bryantwood Road
Works, Holloway Road, N.7
Wilson, W. J. & Co. Lim., 45, Bedford
Row, W.C.1

Bandages and Antiseptic Dressings.

- Grout & Co. Lim., Great Yarmouth
Robinson & Sons Lim., Chesterfield

Bottle Manufacturers and Merchants.

- Beatson, Clark & Co. Lim., Rotherham

Dietetic Articles (Manufacturers of).

- Brown, Gore & Welch Lim., Corn Ex-
change Chambers, Seething Lane, E.C.3
(Gautier Frères' Brandy)
Brusson Jeune & Co., 311, Gray's Inn
Road, W.C.1
Burrow, W. & J. Lim., The Springs,
Malvern (Waters)
Cadbury Bros. Lim., Bournville, Birming-
ham
Camwal Lim., 112, Pembroke Street, N.
(Waters)
C.W.S. Milk Dept., 1, Balloon Street,
Manchester (Nutrix Milk Food)
Hugon & Co. Lim., Openshaw, Manchester
Ingram & Royle Lim., Bangor Wharf,
45, Belvedere Road, S.E.1 (Waters)
Kond's Euonymised Cocoa (May, Roberts
& Co. Lim., 9, Clerkenwell Road, E.C.)
Orme, Jas. & Sons Lim., Liverpool (Toffies)
Oxo Lim., Thames House, E.C.4
Prideaux's Pure Casein & Life Food Co.
Lim., Motcombe, Dorset
Rattray, A. Dewar, 188, Dumbarton Road,
Partick, Glasgow (Wines and Spirits)
Salt Union Lim., Colonial House, Liverpool
Sana Gluten Bread, 1, Manor Road,
Brookley, S.E.4
Schweitzer's Cocoonina (Fletcher, Fletcher
& Co. Lim., Thane Rd., Holloway, N.7)
Therapeutic Foods Co. Lim., Energen
Works, Bridge Rd., Willesden, N.W.10
Valentine's Meat-Juice Co., Richmond,
Virginia, U.S.A.

Druggists (Principal Wholesale).

- Allen & Hanburys Lim., Bethnal Green,
E.2
Alliance Drug & Chemical Co., 10, Beer
Lane, Great Tower Street, E.C.3
Anglo-American Oil Co. Lim., (Nujol),
Albert Street, Camden Town, N.W.1
Anglo-American Pharmaceutical Co. Lim.,
Dingwall Road, Croydon
Anglo-French Drug Co. Lim., 238a, Gray's
Inn Road, W.C.1
Bell (John) & Croyden Lim., 50, Wigmore
Street, W.1
Biozone Lim., 9 & 10, Fenchurch St., E.C.3
Boots Pure Drug Co. Lim., Station Street,
Nottingham
British Colloids Lim., (The Crookes
Laboratories), 22, Chenies Street, W.C.1
Burroughs Wellcome & Co., Snow Hill
Buildings, E.C.1
Chinosol Hygienic Co., 48, Cranwich Road,
N.16
Clayton Aniline Co. Lim., 40, Southwark
Street, S.E.1
Cox, Arthur H. & Co. Lim., Brighton
Drug and Chemical Corporation Lim.,
204-6, Great Portland Street, W.1
Duncan, Flockhart & Co., 104-108, Holy-
rood Road, Edinburgh, and 155, Far-
rington Road, E.C.1
Edme Lim., Broad Street House, E.C.2
Fellows Medical Mfg. Co., Incorporated,
26, Christopher Street, New York
Ferris & Co. Lim., Bristol
Fletcher, Fletcher & Co. Lim., Thane
Road, Holloway, N.7
Giles, Schacht & Co., Clifton, Bristol
Guyot-Guenin & Son, 67, Southwark
Bridge Road, S.E.
Handford & Dawson, Harrogate
Henry, A. C., 19, St. Dunstan's Hill, E.C.3
Hewlett, C. J. & Son Lim., 35-42, Char-
lotte Street, E.C.2
Hoffmann - La Roche Chemical Works
Lim., 7 and 8, Idol Lane, E.C.3
Kolynos Incorporated, Chenies Street,
W.C.1 (Dental Cream)
Macfarlan, J. F. & Co., Edinburgh
May, Roberts & Co. Lim., 7-13, Clerken-
well Road, E.C.1
Napp, H. R. Lim., 3 & 4, Clements Inn,
W.C.2
Newbery, F. & Sons Lim., Charterhouse
Square, E.C.1
Parke, Davis & Co., 50-54, Beak Street,
Regent Street, W.1
Reynolds & Branson Lim., 13, Briggate,
Leeds
Roberts & Co., 76, New Bond Street, W.
Robertson, John & Co., 24, N.-W. Circus
Place, Edinburgh
Ronsheim & Moore, 11a, Wormwood St.,
E.C.2
Saccharin Corporation Lim., 72, Oxford
Street, W.1
S. P. Charges Co., St. Helens, Lancs.

St. Amand Manufacturing Co. Lim., 139, Temple Chambers, E.C.4
 Salamon & Co. Lim., Rainham, Essex
 Savory & Moore Lim., 143, New Bond Street, W.1
 Southall Bros. & Barclay Lim. Birmingham
 Squire & Sons Lim., 413, Oxford St., W.1
 Sumner, R. & Co. Lim., 40, Hanover Street, Liverpool
 Willows, Francis, Butler & Thompson Lim., 89A, Shacklewell Lane, E.8
 Woolley, Jas., Sons & Co. Lim., Victoria Bridge, Manchester
 Wyleys Lim., Coventry
 Young, Arch. & Son, 57-61, Forrest Road, Edinburgh

Electro-Medical, X-Ray, and Scientific Instrument Makers.

Betax Manufacturing Co. Lim. (Props., Rogers Electric Sales Co.), 486, Oxford Street, W.1
 Calvete, I. Lim., 11, Little St. Andrew Street, W.C.2
 Cox-Cavendish Electrical Co. (1924) Lim., 105, Great Portland Street, W.1
 Dean, A. E. & Co., Leigh Place, Brooke Street, Holborn, E.C.1
 Fallowfield (Jonathan) Lim., 61-62, Newman Street, W.1 (X-ray Photographic supplies)
 Flatters & Garnett Lim., 309, Oxford Road, Manchester (Microscopical Apparatus)
 Imperial Dry Plate Co. Lim., Cricklewood, N.W.2 (X-ray Photographic supplies)
 Kodak Lim. (X-ray Dept.), Kingsway, W.C.2
 Mottershead & Co., 7, Exchange Street, Manchester
 Newton & Wright Lim., 471-473, Hornsey Road, N.19
 Siemens Brothers & Co. Lim., Woolwich, S.E.18

Hospital Bed and Furniture Manufacturers.

Evered & Co. Lim., Surrey Works, Snethwick, Birmingham
 Hoskins & Sewell Lim., Bordesley, Birmingham

Motor Car Manufacturers and Agents.

Austin Motor Co. Lim., Longbridge Works, Northfield, Birmingham
 Standard Motor Co. Lim., Coventry

Opticians.

Brown (Clifford) Lim., 45, Wigmore St. W.1
 Clarke (Clement) Lim., 16, Wigmore St. W.1
 Hamblin (Theodore) Lim., 15, Wigmore Street, W.1
 Spiller (George) Lim., 32, Wigmore St., W.1

Printers (Medical).

Cassell & Co. Lim., La Belle Sauvage, Ludgate Hill, E.C.4
 Wright, John & Sons Lim., Stonebridge, Bristol

Publishers and Booksellers (Medical).

Adlard & Son and West Newman Lim., 23, Bartholomew Close, E.C.1
 Allen (Geo.) & Unwin Lim., 40, Museum Street, W.C.1
 Appleton, D. & Co., 25, Bedford Street, Covent Garden, W.C.2
 Arnold, E. & Co., 41 & 43, Maddox St. W.1
 Baillière, Tindall & Cox, 8, Henrietta Street, W.C.2
 Bale, John Sons & Danielsson Lim., 83-91, Great Titchfield Street, W.1
 Black, A. & C. Lim., Soho Square, W.1
 Bryce, Wm., 54 & 54A, Lothian Street, and 15, Teviot Pl., Edinburgh (Bookseller)
 Butterworth & Co., Bell Yard, Temple Bar, W.C.2
 Cambridge University Press (C. F. Clay), Fetter Lane, E.C.4
 Cassell & Co. Lim., La Belle Sauvage, Ludgate Hill, E.C.4
 Chambers, W. & R. Lim., 38, Soho Square, W.1; and 339, High St., Edinburgh
 Churchill, J. & A., 7, Great Marlborough Street, W.1
 Constable & Co. Lim., 10-12, Orange Street, W.C.2
 Cornish Bros. Lim., 39, New Street, Birmingham
 Faber & Gwyer Lim., 24, Russell Square, W.C.1
 Fannin & Co. Lim., Grafton Street, Dublin (Booksellers)
 Foyle, W. & G. Lim., 121-125, Charing Cross Road, W.C.2 (Booksellers)
 Green, W. & Son Lim., St. Giles Street, Edinburgh
 Griffin, Chas. & Co. Lim., 42, Drury Lane, Strand, W.C.2
 Heinemann, William (Medical Books) Lim., 20, Bedford Street, W.C.2
 Homeopathic Publishing Co., 12a, Warwick Lane, E.C.4
 Kimpton, Henry (Hirschfeld Bros. Lim.), 263, High Holborn, W.C.1
 Lewis, H. K. & Co. Lim., 136, Gower Street, & 24 & 28, Gower Place, W.C.1
 Lippincott, J. B. Co., 16, John Street, Adelphi, W.C.2
 Livingstone, E. & S., 16 & 17, Teviot Place, Edinburgh
 Longmans, Green & Co. Lim., 39, Paternoster Row, E.C.4
 Macmillan & Co. Lim., St. Martin's Street, W.C.2
 Murray, John, 50a, Albemarle Street, W.1
 Oliver & Boyd, Tweeddale Court, Edinburgh
 Oxford Medical Publications (Oxford University Press—Humphrey Milford), Amen House, Warwick Square, E.C.4
 Paul (Kegan), Trench, Trübner & Co. Lim., 68-74, Carter Lane, E.C.4
 Philip, Geo. & Son Lim., 32, Fleet Street, E.C.4 (Anatomical Models)
 Pulman, Geo. & Sons Lim., 24, Thayer Street, W.1
 Putnam's, G. P., Sons, Lim., 24, Bedford Street, W.C.2

Saunders, W. B. Co., Lim., 9, Henrietta Street, W.C.2
 Scientific Publishing Co., 38, Central Avenue, Calcutta
 Shaw & Sons Lim., 7-9, Fetter Lane, E.C.4
 Sherratt & Hughes, University Press, 34, Cross Street, Manchester
 Simpson, Marshall, Hamilton, Kent & Co. Lim., Stationers' Hall Court, E.C.4
 Thacker, W. & Co., 2, Creed Lane, E.C.4 (Thacker, Spink & Co., Calcutta)
 Thin, James, 54-56, South Bridge, Edinburgh (Bookseller)
 University of London Press Lim., 17, Warwick Square, E.C.4
 Wright, John & Sons Lim., Stonebridge, Bristol (and Printers); London Depot, Stationers' Hall Court, E.C.4

Shelters for Open-air Treatment.

Beattie, G. W. Lim., 189, Upper Richmond Road, Putney, S.W.15
 Hobson, J. T. & Co., Bedford
 Strawson, G. F., St. Andrew's Works, Horley, Surrey

Surgical and Medical Instrument and Appliance Manufacturers.

Ajax Lim., 117, Central Street, E.C.1
 Alexander & Fowler, 104 and 106, Pembroke Place, Liverpool
 Allen & Hanburys Lim., 48, Wigmore Street, W.1
 Amalgamated Dental Co. Lim. (formerly De Trey & Co. Lim., and Claudius Ash, Sons & Co. Lim.), "Solila House," 7-9, Swallow Street, Piccadilly, W.1
 Bailey, W. H. & Son Lim., 45, Oxford St., W.1, and 2, Rathbone Place, W.1
 Bell (John) & Croyden Lim. (incorporating Arnold & Sons), 50, Wigmore St., W.1
 Braid, A. E. & Co. Lim., 30, Gower Place, Gower Street, W.C.1
 British Hanovia Quartz Lamp Co. Lim., Slough, Bucks.
 Critchley, J. & Sons, 18, Great George Street, Liverpool
 Davis & Geck, Inc., 211-221, Duffield St., Brooklyn, New York, U.S.A. (Sutures)
 Dental Manufacturing Co. Lim., Alston House, Newman Street, W.1
 Domen Belts Co. Lim., 456, Strand, W.C.2
 Dowie & Marshall Lim., 455, West Strand, W.C.2 (Hygienic Bootmakers)
 Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.1
 Dowsing Radiant Heat Co. Lim., 91 & 93, Baker Street, W.1
 Evans, A. E., 38, Fitzroy Street, W.1
 Ferris & Co. Lim., Bristol
 Gardner, J. & Son, 32, Forrest Road, Edinburgh
 Grossmith, W. R. Lim., 12, Burleigh Street, Strand, W.C.2
 Hawksley & Sons, 351, Oxford Street, W.1
 Haywood, J. H. Lim., Castle Gate, Nottingham
 Hill, W. & Co., 70 & 72, Chancery Lane, W.C.2

Hilliard, W. B. & Sons, 123, Douglas St. Glasgow
 Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.1
 Holland, T. & Son, 46, South Audley St., W.1 (Foot Supports)
 Hospitals Contracts Co. Lim., 25-35, Mortimer Street, W.1
 Inhaling Drug & Apparatus Co. Lim., 30, Grosvenor Place, S.W.1
 Maw, S., Son & Sons Lim., 7-12, Aldersgate Street, E.C.1
 Mayer & Phelps, 59 & 61, New Cavendish Street, W.1
 Medical Supply Association Lim., 167-185, Gray's Inn Road, W.C.1
 Medical Surgical Sundries Lim., 97, Swin-derby Road, Wembley
 Merson, G. F. Lim., St. John's Hill Works, Edinburgh (Surgical Catgut)
 Millikin & Lawley, 165, Strand, W.C.2
 Montague, J. H., 69, New Bond Street, W.1
 Reynolds & Branson Lim., 13, Briggate, Leeds
 Salmon Ody Lim., 7, New Oxford Street, W.C.1 (Trusses and Foot Supports)
 Simmons & Co., 1-7, Tanner Street, S.E. (Ambulances)
 Sumner, R. & Co. Lim., 40, Hanover Street, Liverpool
 Surgical Manufacturing Co., Lim., 83-85, Mortimer Street, W.1
 Thackray, C. F., Great George St., Leeds
 Weiss, John & Son Lim., 287, Oxford Street, W.1
 Woolley, Jas. Sons & Co. Lim., Victoria Bridge, and 76, Deansgate, Manchester
 Young, Arch. & Son, 57-61, Forrest Road, Edinburgh

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Zeal, G. H. Lim., 77, St. John Street, E.C.1

Typewriters.

Nussle, J. C. & Co. ("Perkeo" Portable), 4, New London Street, E.C.3.

Typewriting (Medical).

Erwin, The Misses, 20, Hanover Square, W.1

Vaccine Lymph.

Dr. Chaumier's Calf Lymph. Roberts & Co., 76, New Bond Street, W.1
 Dr. Doucet's Calf Lymph. Sole Agents for Great Britain and Ireland: Archd. Young & Son, 57-61, Forrest Road, Edinburgh
 Government Lymph Establishment, at Colindale Avenue, The Hyde, N.W.9. Lymph is supplied, free of charge, to Public Vaccinators on application to the Clerk
 Jenner Institute for Calf Lymph Lim., 73, Church Road, Battersea, S.W.11
 Rebman's Pure Aseptic Calf Lymph. Sole Agent: Wm. Heinemann (Medical Books) Lim., 20, Bedford Street, W.C.2

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ANALGESIC BALSAM

(Ung. Methyl. Sal. Co. Fort. B.P.C.)

For Analgesic effect in Rheumatism, particularly useful in muscular Rheumatism in limbs.
Price: In Collapsible Tubes, 12/- dozen

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This will be found most useful in the treatment of Hemorrhoids, and as an application to inflamed mucous surfaces.

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A concentrated carminative and stimulant, superior to and more economical than Tinct. Cardamomi Co. as a colouring and flavouring agent. Compatible with either Acids or Alkalies. Dose— $\frac{1}{4}$ to 2 fluid drachms (2 to 8 c.c.).

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Each fluid drachm contains in a soluble form Heroin $\frac{1}{10}$ grain, Terpin Hydrate 1 grain. The addition of terpin hydrate has been found beneficial in chronic winter cough and bronchitis. Dose— $\frac{1}{2}$ to 1 fluid drachm in an ounce of water.

ELIXIR UROSOL CO. - - - per lb. 7/6

A valuable remedy in Chronic Gout and Rheumatoid Arthritis, diminishing pain and joint swelling by eliminating Uric Acid. Its use is also indicated in bladder and urinary affections, and in cases of Phosphaturia and Calculi.

Elixir Urosol Co. is pleasant to take, and is miscible in all proportions. Each fluid drachm represents Colchicin Salicylate $\frac{1}{10}$ grain, Urosol (Hexamine) 2 grains, Lithium Guaiacate 2 grains, Lithium Salicylate 5 grains. Dose—1 fluid drachm diluted, twice a day, between meals.

MIST. BISMUTH COMP. - - - per lb. 5/6

Each fluid half drachm equivalent to: Tr. Nux. Vom. m. 8; Acid Hydrocyan. P.B. m. 2; Morph. Mur. gr. $\frac{1}{4}$; Liq. Bismuthi m. 60; associated with Chloroform and Aromatics; and coloured as Tr. Card. Comp. Dose—15 to 30 min.

MIST. BISMUTH c. PEPSIN - - - per lb. 6/6

NEURACETIN

In POWDER: 1-oz. boxes, 2/6

In PELLETS (5 grs.): 1-oz. bottle, 3/-

Introduced in 1897, and since proved safe and reliable.

Action: Antipyretic, Analgesic, Anti-neuralgic, and Anodyne.

Relieves pain and reduces temperature, at the same time free from after-effects.

Dose: 5 to 10 grains.

RUSCOL - - - PRICE IN BULK: $\frac{1}{2}$ -lb. pots, 3/- each

(Registered Trade Mark)

1-lb. pots, 5/- each

An organic compound of Bismuth and Birch Tar. This ointment has been found most successful in cases of Eczema, Erysipelas, Pruritus, and all Skin Diseases, either itching or inflammatory. Its action is immediately sedative, and its antiseptic and curative properties have been aptly compared with those of Iodoform, without the unpleasant odour of that substance.

SYR. TUSSIS (Dispensary) - - - per lb. 2/-

Each fluid drachm containing in a condensed form:—Tinct. Camp. Co. 25 minims; Vin. Ipecac. 5 minims; Oxymer. Scilla, 20 minims; Syr. Tolu, 15 minims; Syr. Rhacados, 15 minims. A really efficient cough syrup and an excellent base for other mixtures.

WYLEYS Ltd. Manufacturing Chemists, **COVENTRY.**

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. If entered in the following pages any note can be immediately found when required.

1926

JANUARY.	
S	* 31017 3481
M	* 41118 25 *
Tu	* 51219 26 *
W	* 61320 27 *
Th	* 71421 28 *
F	* 1 815 22 29 *
S	* 2 916 23 30 *

NOTES.

Copy here any formula or fact you wish
to keep for reference.

1926

FEBRUARY.	
S	* 71421 28 *
M	* 1 815 22 *
Tu	* 2 916 23 *
W	* 31017 24 *
Th	* 41118 25 *
F	* 51219 26 *
S	* 61320 27 *

INCOME TAX—££££ SAVED

In adjusting the liability of many Medical Practitioners with Inspectors of Taxes, we have saved substantial sums for our clients—£422, £325, £292, £269, £178, and £121 are a few actual amounts. Our experience proves that Doctors are frequently over-assessed.

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Phone—HOLLY BN 6659.

1926

MARCH.	
S	* 714 21 28
M	1 815 22 29
Tu	2 916 23 30
W	3 1017 24 31
Th	4 1118 25 *
F	5 1219 26 *
S	6 1320 27 *

NOTES.

1926

APRIL.	
S	* 41118 25
M	* 51219 26
Tu	* 61320 27
W	* 71421 28
Th	1 81522 29
F	2 91623 30
S	3 1017 24 *

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DR BARNARDO'S HOMES

IS

"NO DESTITUTE CHILD EVER REFUSED ADMISSION."

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See Advertisement, p. lvi.

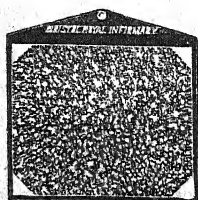
1926

MAY.	
S	• 2 9 16 23 30
M	• 8 10 17 24 31
Tu	• 4 11 18 25 •
W	• 5 12 19 26 •
Th	• 6 13 20 27 •
F	• 7 14 21 28 •
S	• 1 8 15 22 29 •

NOTES.

1926

JUNE.	
S	• 6 13 20 27
M	• 7 14 21 28
Tu	1 8 15 22 29
W	2 9 16 23 30
Th	3 10 17 24 •
F	4 11 18 25 •
S	5 12 19 26 •



WRIGHT'S CHART HOLDERS

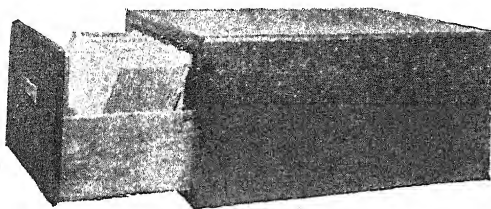
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Samples to Hospitals free on application.
Prices for quantities, from 2/- net each in Leatherette.

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SINGLE DRAWER CABINET.

The Publishers have prepared a complete "Card Index" System for Account Keeping. The records are printed on a good-quality Card, and Cabinets to hold them are supplied. They have given considerable time to perfecting the system to meet the needs of the Profession.

OAK CABINETS.—Well-made and handsome Cabinets in polished Oak, mounted with brass fittings, are supplied as follows:—

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Superior Quality 1 " £2 0s. 0d. 2 " £3 5s. 0d.

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Bell, Robt. J. " " "	Be	
Biddington, C. " " "	Bi	

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JOHN WRIGHT & SONS Ltd., Publishers, BRISTOL

1926

JULY.	
S	4 11 18 25
M	5 12 19 26
Tu	6 13 20 27
W	7 14 21 28
Th	1 8 15 22 29
F	2 9 16 23 30
S	3 10 17 24 31

NOTES.

1926

AUGUST.	
S	1 8 15 22 29
M	2 9 16 23 30
Tu	3 10 17 24 31
W	4 11 18 25
Th	5 12 19 26
F	6 13 20 27
S	7 14 21 28

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14.—	75 Ditto, Waistcoat Pocket Size, 2½ in. by 4½ in. . .	1/- net	10/6 net.
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1926

SEPTEMBER.	
S	* 5 12 10 26
M	* 6 13 20 27
Tu	* 7 14 21 28
W	1 8 15 22 29
Th	2 9 16 23 30
F	3 10 17 24 *
S	4 11 18 25 *

ADDRESSES (PRIVATE).

1926

OCTOBER.	
S	* 2 10 17 24 31
M	* 4 11 18 25 *
Tu	* 5 12 19 26 *
W	* 6 13 20 27 *
Th	* 7 14 21 28 *
F	1 8 15 22 29 *
S	2 9 16 23 30 *

BISEDIA

See full announcement on page lxii.

An Elegant and Effective Preparation for
 GASTRO-INTESTINAL
 DISTURBANCE COMPLICATED
 WITH VOMITING.

GILES, SCHACHT & CO., CLIFTON, BRISTOL.

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The illustration displays a variety of ophthalmic instruments. At the top left is a pair of eyeglasses (980). Next to it is a small instrument (422). Below these are two more pairs of eyeglasses (826 and 835). To the right of the eyeglasses are three circular charts or lenses (834, 835, 834). Further right is a large, complex instrument (315) and a tall, thin stand (952). In the center, there are several cylindrical instruments (500, 504, 501, 506) and a small instrument (511). On the left side, there is a large, complex instrument (604) and a smaller one (605). At the bottom, there are two charts (811, 809) and a large, complex instrument (810). To the right of the charts are two circular charts (823, 825) and a small stand (601).

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LONDON, W.1.

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Sums not over £3 £10 £20 £30 £40
the charge is 4d. 6d. 8d. 10d. 1s.

1926

NOVEMBER	
S	* 714 21 2
M	1 815 22 99
Tu	2 916 24 80
W	810 17 24 *
Th	411 18 25 *
F	612 19 26 *
S	613 0 7

NURSES.

Note whether Midwifery or Sick Nurses, their terms
and addresses.

1926

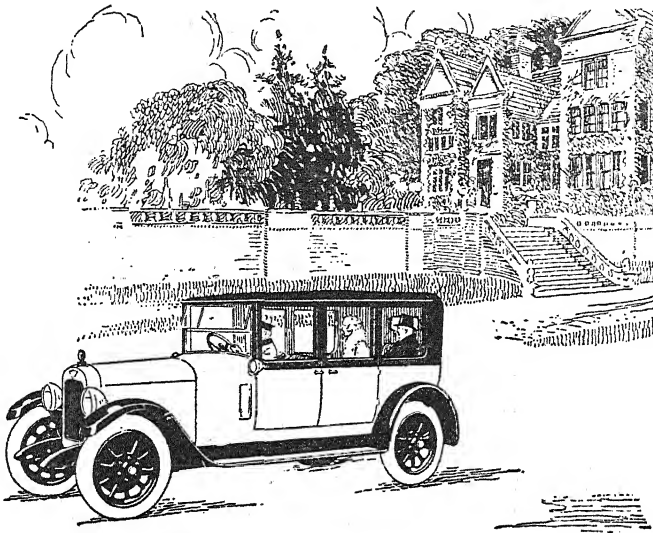
DECEMBER	
S	* 512 19 28
M	* 613 20 27
Tu	* 714 21 24
W	1 815 22 29
Th	2 916 23 30
F	810 17 24 81
S	411 18 25 *

The FRENCH NATURAL MINERAL WATER

VICHY-CÉLESTINS

For GOUT, RHEUMATISM, INDIGESTION, and
AFFECTIONS OF THE LIVER AND STOMACH.

See Advertisement, page 602.



Austin

CARS ARE AVAILABLE FOR
ALL AND EVERY PURPOSE.

Dignified in Appearance—Silent in Running.
Comfortable to ride in—Low to maintain.
In perfect keeping with a doctor's standing.

The "AUSTIN SEVEN" - - - £149

The "AUSTIN TWELVE" from £340 to £455

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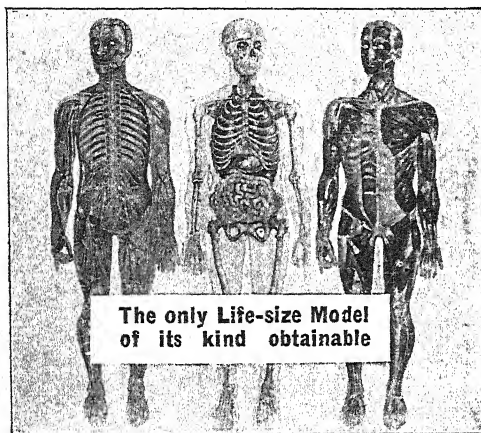
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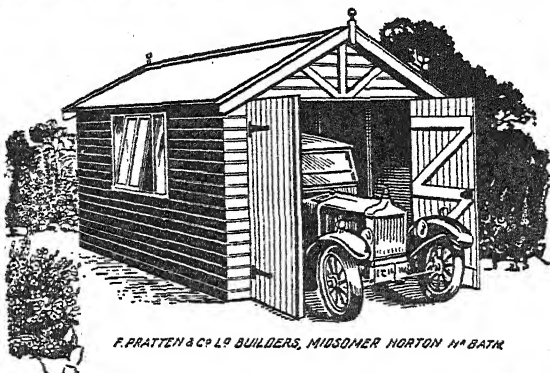
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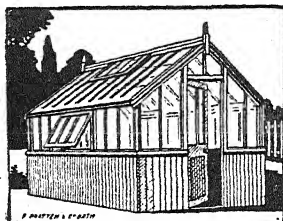
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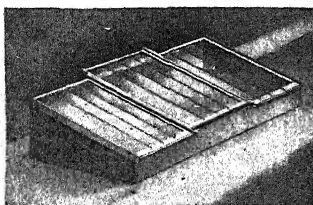
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Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. <i>Gen. Man.</i> , C. H. Falloon. <i>Act. &</i> <i>Life Man.</i> , William Penman .. P	1808	49/3	63/7	89/8	4,297,030
Australian Mutual Provident Society , Life Endowments and Annuities, 73-76, King William Street, E.C.4. <i>Manager</i> for U.K., W. C. Fisher. Further particulars see page 7 M	1849	48/2	64/5	89/10	55,812,779
Britannic Assurance Co. Ltd. , Life, Fire, Accident, and General Insurances, Broad Street Corner, Birmingham. <i>Chair-</i> <i>man</i> , Jno. A. Jefferson, <i>Secretary</i> , J. M. Laing, F.I.A. Further particulars see page 6 P	1866	47/9	64/-	91/1	10,000,000
British Equitable Assurance Co. Ltd., 1, 2, 3, Queen Street Place, E.C. <i>Manager</i> , Douglas A. Coleman P	1854	48/8	64/11	91/9	1,503,156
Caledonian Insurance Co., 19, George Street, Edinburgh. <i>Gen. Man.</i> , R. Hill Stewart, F.F.A. <i>London Office</i> , 15, Coleman St., E.C.2, and 16, Pall Mall, S.W. .. P	1805	48/9	64/6	88/6	5,038,494
Canada Life Assurance Co., 2, St. James's Square, S.W.1. <i>Man.</i> , J. R. Wandless. F.I.A. P	1847	48/5	65/4	94/2	20,440,519
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William Street, E.C.4. <i>Gen.</i> <i>Man. & Act.</i> , A. D. Besant .. P	1824	47/6	65/2	94/10	8,464,681
Colonial Mutual Life Assurance Society Ltd., 33, Poultry, E.C. <i>Man.</i> , Arthur E. Gibbs. <i>Assist. Man.</i> , Ernest A. Cawdron .. M	1873	48/9	65/1	89/10	7,172,153
Commercial Union Assurance Co. Ltd., 24, 25, and 26, Cornhill, E.C. <i>Act.</i> , A. G. Allen P	1861	47/10	65/2	92/4	11,812,571
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones M	1867	47/4	63/1	90/1	2,203,692
Eagle Star & British Dominions Insurance Co. Ltd., Head Office, 1, Threadneedle Street, E.C.2.; Life Dept., 32, Moorgate, E.C.2. <i>Man. Dir.</i> , Sir Edward M. Moun- tain, Bart., J.P. P	1807	49/9	66/3	93/8	14,267,609
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. <i>Act. & Man.</i> , W. Palin Hiderton, F.I.A. M	1762	54/-	68/-	92/-	5,555,045
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. & Sec.</i> , W. P. Phelps, M.A., F.I.A. .. P	1844	48/10	64/6	90/9	5,943,155
Friends' Provident & Century Life Office, 42, Kingsway, W.C.2, and 18, Charlotte Sq., Edinburgh. <i>Gen. Man.</i> , Henry J. Tapscott, <i>Act. & Sec.</i> , Alld. Moorhouse, F.I.A. .. M	1832	48/-	64/3	89/9	4,618,884
General Accident Fire and Life Assurance Corporation Ltd. (Life Dept.), General Buildings, Aldwych, W.C.2. <i>Act. & Sec.</i> , J. Mayhew Allen P	1885	49/2	64/11	91/3	1,978,069

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Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. <i>Sec.</i> , J. Stirling P	1805	48/4	64/-	89/10	9,355,814
Legal & General Assurance Society Ltd., 10, Fleet St., E.C. <i>Gen. Man.</i> , W. A. Workman P	1836	36/4	50/8	74/8	16,417,663
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Liverpool and London and Globe Insurance Co. Ltd., 7, Dale Street, Liverpool. <i>Gen. Man. & Sec.</i> , Hugh Lewis. London Office, 1, Cornhill, E.C. P	1836	49/10	65/9	91/3	6,517,513
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London Assurance, The, 1, King William St., E.C. <i>Man. of Life Dept. and Act.</i> , A. G. Hemming, F.I.A. P	1720	49/-	64/8	90/2	3,972,500
London Life Association Ltd., 5, Mansion House St., E.C.2. (Temp. while re-building). <i>Act. & Man.</i> , H. M. Trouncer, M.A., F.I.A. M	1806	47/-	61/8	85/4	8,903,466
Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. <i>Act. & Sec.</i> , Howard T. Cross, F.I.A. M	1852	48/10	65/-	91/6	2,756,691
Medical Sickness Annuity & Life Assurance Society Ltd., 300, High Holborn, W.C. <i>Man. & Sec.</i> , Bertam Sutton, F.C.I.I. M	1884	47/2	53/3	80/-	122,397
Metropolitan Life Assurance Society, 13, Moorgate, E.C.2. <i>Act. & Man.</i> , H. J. Baker, F.I.A. M	1835	49/9	66/4	92/-	2,472,634
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Effingham Ho., 1, Arundel St., W.C. <i>Man.</i> , Alex. S. Sellar, M.A., F.F.A. P	1886	48/9	65/3	89/9	14,378,868
National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C. <i>Act. & Man.</i> , G. Mark, C.B.E., F.I.A. <i>Asst. Act.</i> , G. H. Recknall, F.I.A., F.F.A. <i>Sec.</i> , G. V. S. Booth M	1830	48/4	63/7	89/6	4,106,743
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. <i>Man.</i> , H. W. Meyers. M	1869	46/8	61/6	87/2	22,000,000
National Provident Institution, 48, Gracechurch Street, E.C.3. <i>Act. & Sec.</i> , L. F. Hovill, F.I.A. M	1835	50/2	66/3	91/1	9,049,679
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Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. <i>Gen. Man.</i> , W. Aneas Mackay. <i>Asst. Gen. Man.</i> , K. K. Peters P	1836	49/-	64/8	90/10	5,593,570
Norwich Union Life Insurance Society, Norwich. <i>Gen. Man. & Act.</i> , M. Mackenzie Lees, F.F.A. <i>Sec.</i> , H. G. Wilton, F.I.A. London Office, 49, Fleet Street, E.C.4. M	1808	51/9	66/6	92/5	23,768,799
Pearl Assurance Co. Ltd., 252, High Holborn, W.C. <i>Man's Director</i> , G. Shrubbsall, J.F. P	1864	49/-	65/-	92/-	31,208,984
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C. 11, Waterloo Place, S.W.1. & 187, Fleet Street, E.C.4. <i>Gen. Man.</i> , R. Y. Sketch P	1782	48/11	64/7	90/8	12,627,038

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Prudential Assurance Co. Ltd., Holborn Bars. <i>Sec.</i> , Sir George May, K.B.E. Further particulars see page 7 P	1848	47/-	64/6	91/2	159,380,645
Refuge Assurance Co. Ltd., Oxford Street, Manchester. <i>Man. Directors</i> , Jas. S. Proctor, and J. Proctor Green. <i>Gen. Man.</i> , W. H. Aldcroft, F.I.A., London Office, 133, Strand, W.C. P	1864	49/3	65/9	91/9	29,187,316
Royal Exchange Assurance, Royal Exchange, E.C. 3, and 44, Pall Mall, S.W. 1. <i>Act.</i> , T. F. Anderson, F.I.A., F.F.A. P	1720	49/-	64/9	90/2	6,452,623
Royal Insurance Co. Ltd., 1, North John St., Liverpool. <i>Gen. Man.</i> , J. J. Atkinson. London Offices, 24-28, Lombard Street, E.C. 3. <i>London Man.</i> , R. McConnell P	1845	48/8	64/4	89/8	16,477,520
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. <i>Gen. Man.</i> , W. Hutton. <i>Sec. & Act.</i> , R. Gordon-Smith. London Office, 17, Tokenhouse Yard, E.C. 2. <i>Sec.</i> , P. K. Fenton M	1826	51/9	66/3	90/1	8,447,240
Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. <i>Gen. Man.</i> , C. Guthrie. <i>Sec.</i> , A. H. Lough. London Office, 13, Cornhill, E.C. 3. <i>Sec.</i> , P. W. Purves. (<i>Premiums cease at age 75</i>) M	1831	50/6	67/6	97/-	7,353,174
Scottish Life Assurance Co. Ltd., 19, St. Andrew Square, Edinburgh. <i>Man.</i> , Lewis P. Orr, F.F.A., F.R.S.E. London Office, 9, King Street, E.C. 2. <i>Sec.</i> , I. Campbell P	1881	49/5	64/6	90/5	4,111,739
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. <i>Man.</i> , R. T. Boothby. <i>Joint Secs.</i> , C. W. Thomson, & A. Graham Donald. <i>Act.</i> , J. R. Armstrong. London Offices, 3, Lombard St. E.C. 3, and 17, Pall Mall, S.W. 1 M	1837	42/4	56/6	83/2	18,500,000
Scottish Temperance & British General Assurance Co., Ltd., 109, St. Vincent Street, Glasgow. <i>Manager</i> , Adam K. Rodger. London, 2, 3 & 4, Cheapside. <i>Man.</i> , C. S. McDonald. (<i>Less 10 per cent to Abstainers</i>) P	1883	48/6	63/9	89/10	4,342,690
Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh. <i>Gen. Man.</i> , James G. Nicoll. London Office, 5, Walbrook, E.C. 4. <i>Sec.</i> , A. J. Queen P	1824	50/-	65/8	92/-	9,323,269
Scottish Widows' Fund Life Assurance Society, 9, St. Andrew Square, Edinburgh. <i>Man. & Act.</i> , G. J. Ildstone. <i>Sec.</i> , Harold G. Sharp. London Offices, 28, Cornhill, E.C. 3, and 17, Waterloo Place, S.W. 1. M	1815	51/9	66/3	90/7	25,000,000
Standard Life Assurance Co., 3, George Street, Edinburgh. <i>Man.</i> , S. E. Macnaghten. London Offices, 110, Cannon Street, E.C. 4. <i>Sec.</i> , A. B. Drayton, and 15a, Pall Mall <i>Sec.</i> , E. V. Goodall M	1825	48/5	64/4	90/1	14,119,000
Sun Life Assurance Society, 63, Threadneedle Street, E.C. 2. <i>Sec. & Gen. Man.</i> , E. Innuell. <i>Joint Gen. Man. & Act.</i> , R. G. Salmon, F.I.A. <i>Asst. Sec.</i> , G. M. Scarle, F.I.A. P	1810	49/2	66/6	94/2	15,844,539
Sun Life Assurance Co. of Canada, Sun of Canada House, Victoria Embankment (near Temple Station), W.C. 2. <i>Man.</i> , J. F. Junkin P	1865	48/5	65/4	94/1	54,374,752
United Kingdom Provident Institution, 106, Strand, W.C. 2. <i>Sec.</i> , H. W. Hasler. <i>Act.</i> , C. C. Nicholl, B.A., F.I.A., F.F.A. <i>Asst. Act.</i> , W. G. Barrett, F.I.A. M	1840	50/3	66/7	92/7	*13,500,000

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University Life Assurance Society, 25, Pall Mall, S.W.1. <i>Ad. & Sec.</i> , R. Todhunter, M.A. P	1825	52/4	68/9	94/10	£ 1,109,039
Wesleyan & General Assurance Society, Life, House Purchase, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. <i>Gen. Man.</i> , A. L. Hunt. London Office, Halton House, 20-23, Holborn, E.C.1. Further particulars see page 6 M	1841	48/1	65/3	93/10	5,981,946
Yorkshire Insurance Company, Ltd., Chief Offices: St. Helen's Square, York. Bank Buildings, Princes Street, E.C.2. London Branches, 17, Mincing Lane, E.C.3; 48, Pall Mall, S.W.1; 49, Sloane Square, S.W.1; 496, Brixton Road, S.W.9; 6, Norfolk Street, Strand, W.C.2; 43, Broadway, Stratford, E.15; 551, Hurl Road, Tottenham, N.17; 280, Ruston Road, N.W.1. Further particulars, page 5 F	1824	40/1	64/9	91/7	4,609,981

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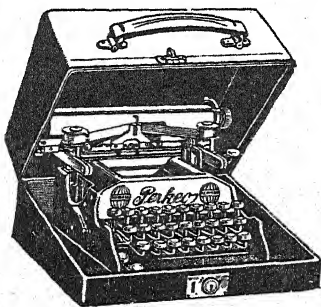
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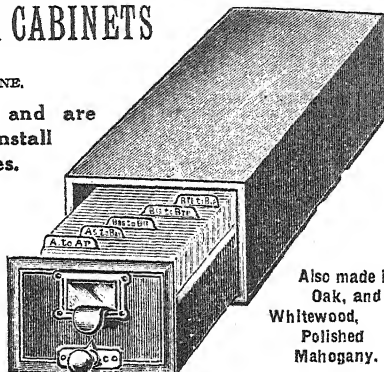
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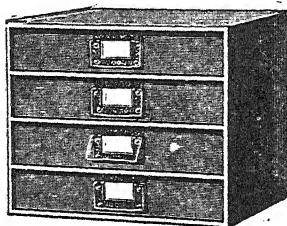
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ST. MARY'S HOSPITAL MEDICAL SCHOOL

(University of London)

SESSIONS 1925-1926.

WINTER. First Term : October 1st to December 11th, 1925.

Second Term : January 4th to March 17th, 1926.

SUMMER. April 20th to July 8th, 1926.

SITUATION.

St. Mary's is exceptional in its situation, for while it is adjacent to a large poor district in which it serves some 500,000 persons, it is nevertheless so near to Kensington Gardens, and one of the best residential districts of London, that it offers to the Medical Student the unusual possibility of living in close touch with his work, without wearisome journey in an overcrowded train or tube.

CLINICAL UNITS IN MEDICINE AND SURGERY.

St. Mary's is one of the 6 Medical Schools in London at which Clinical Units have been established. By this means the Clinical teaching has been raised to the highest possible level, and by the affiliation of several neighbouring Hospitals, 1,000 beds are now available for teaching purposes.

INSTITUTE OF PATHOLOGY AND RESEARCH.

The Institute of Pathology is under the personal direction of SIR ALMROTH WRIGHT, F.R.S., and comprises seven special departments. A number of salaried appointments are available for Students who have qualified, and 13 research beds have been opened.

LYING-IN BEDS.

Lying-in beds have now been added, which provide facilities for practical instruction in midwifery. In addition, all Students take a fortnight's course of Practical Midwifery at Queen Charlotte's Hospital, which is situated within a few minutes' walk of St. Mary's, before holding a post on the Externe Midwifery district attached to the Hospital.

PRIMARY AND FINAL F.R.C.S. COURSES.

A special feature is made of the above Courses which are carried on during the greater part of the year.

SCHOLARSHIPS AND PRIZES.

Three Scholarships of £210 each, and one of £25, are awarded by nomination in July annually. Two University Scholarships of £200 each are awarded annually. Research Scholarships of £200 per annum each are awarded annually in connection with the Institute of Pathology. Numerous other prizes are awarded annually.

ATHLETIC GROUND.

The Athletic Ground (10 acres) is situated at Wembley, and can be reached by tube in 20 minutes. A large pavilion has recently been built at a cost of £3,000.

FEES.

The Composition Fee for the entire Curriculum is £200.

The Composition Fee for the Clinical portion of the Curriculum is 90 guineas.

The Fee for the Amalgamated Clubs is 3 guineas per annum, or a Composition Fee of 10 guineas for the entire Curriculum, or 7 guineas for the Clinical portion only.

C. M. WILSON (M.C.), M.D., F.R.C.P., Dean.

The illustrated Prospectus of the Medical School may be obtained on application to the Secretary, St. Mary's Hospital Medical School, Paddington, W.2.

ST. THOMAS'S HOSPITAL

MEDICAL SCHOOL,

(University of London),

WESTMINSTER BRIDGE, S.E.1.

DEAN: SIR CUTHBERT S. WALLACE, K.C.M.G., C.B.

The Hospital contains over 640 Beds, and a large well-organized Out-Patient Department.

The HOSPITAL AND MEDICAL SCHOOL are situated on the River, opposite the Houses of Parliament, and are easily accessible by Train, Tram, and 'Bus, from all parts of London.

The SCHOOL BUILDINGS are completely equipped and thoroughly up-to-date.

Classes and Lectures in the PRELIMINARY AND INTERMEDIATE SUBJECTS provide complete instruction for all University and the Conjoint Board Examinations.

The facilities for CLINICAL WORK are second to none in London. Clerks and Dressers, who work under the immediate supervision of the Visiting Staff, are appointed every three months in all General and Special Departments of the Hospital.

The institution of CLINICAL MEDICAL AND SURGICAL UNITS offers special advantages to those desiring advanced instruction and practice in these Subjects. The Unit Laboratories are fully equipped for the routine investigation of disease and for research work.

In connection with the Department of Obstetrics and Gynæcology all Students attend the practice of the MATERNITY WARD, before proceeding to work in the District.

The SPECIAL DEPARTMENTS IN THE HOSPITAL provide clinical instruction in all special Subjects.

SPECIAL CLASSES are held for the F.R.C.S., Primary and Final, and other higher Examinations.

HOUSE APPOINTMENTS, Resident and Non-Resident, and Salaried RESEARCH APPOINTMENTS are numerous, and are open to all Students after Qualification.

The SPORTS GROUND is within easy reach of the Hospital.

FEES:

£50 for each period of Twelve months.

Full particulars may be had from—

THE MEDICAL SECRETARY, ST. THOMAS'S HOSPITAL MEDICAL SCHOOL,
WESTMINSTER BRIDGE, S.E.1.

ST. JOHN'S HOSPITAL

For Diseases of the Skin

(INCORPORATED).

IN-PATIENT DEPARTMENT—262, UXBRIDGE ROAD, W.12.
OFFICES AND OUT-PATIENT DEPARTMENT—
49, LEICESTER SQUARE, W.C.2.

OUT-PATIENT ATTENDANCES 1000 A WEEK.

The OUT-PATIENT DEPARTMENT contains Laboratory, Lecture Room, Electrical Department and Medicated Vapour Baths.

The attendance of the Hon. Medical Staff is as follows:—

MONDAY	.. 2 p.m.	DR. GRIFFITH	6 p.m.	DR. DORE
TUESDAY	.. 2 p.m.	DR. FOX	6 p.m.	DR. ROXBURGH
WEDNESDAY	.. 2 p.m.	DR. SIBLEY	6 p.m.	DR. MACCORMAC
THURSDAY	.. 2 p.m.	DR. MACCORMAC	6 p.m.	DR. GRIFFITH
FRIDAY	.. 2 p.m.	DR. ROXBURGH	6 p.m.	DR. ROXBURGH
SATURDAY	.. 2 p.m.	MEDICAL REGISTRAR		

The Hospital is now the recognized centre in London for the Post-Graduate Study of Diseases of the Skin. Teaching is carried out under the auspices of the

LONDON SCHOOL OF DERMATOLOGY.

Consulting Physicians:

JAMES H. STOWERS, M.D.
J. L. BUNCH, M.D., M.R.C.P.

Staff of Lecturers:—

H. G. ADAMSON, M.D., F.R.C.P.	..	St. Bartholomew's Hospital
H. W. BARBER, M.B., F.R.C.P.	..	Guy's Hospital
S. ERNEST DORE, M.D., F.R.C.P.	..	St. Thomas's, Westminster and St. John's Hospitals
WILFRID FOX, M.D., F.R.C.P.	..	St. George's & St. John's Hospitals
A. M. H. GRAY, C.B.E., M.D., F.R.C.P., F.R.C.S.	..	University College Hospital
W. GRIFFITH, M.B., M.R.C.P.	..	St. John's Hospital
H. D. HALDIN-DAVIS, M.B., M.R.C.P., F.R.C.S.	..	Royal Free Hospital
E. GRAHAM LITTLE, M.D., F.R.C.P.	..	St. Mary's Hospital
H. MACCORMAC, C.B.E., M.D., F.R.C.P.	..	Middlesex and St. John's Hospitals
J. M. H. MACLEOD, M.D., F.R.C.P.	..	Charing Cross & St. John's Hospitals
A. C. ROXBURGH, M.D., M.R.C.P.	..	St. Bartholomew's and St. John's Hospitals
J. H. SEQUEIRA, M.D., F.R.C.P., F.R.C.S.	..	London Hospital
W. KNOWSLEY SIBLEY, M.D., M.R.C.P.	..	St. John's Hospital
A. WHITFIELD, M.D., F.R.C.P.	..	King's College Hospital

Lectures and Demonstrations are given regularly during the Winter and Summer Sessions. Instruction is given daily in the Out-Patient Department as above. Special classes or individual teaching can be arranged in the Pathological Department. For fees and further particulars apply to the Dean.

A. C. ROXBURGH, M.D., *Dean.*

COUNTY OF LONDON.

Maudsley Hospital

DENMARK HILL, S.E.5.

Medical Supt. - EDWARD MAPOTHER, M.D., M.R.C.P., F.R.C.S.

THIS HOSPITAL, organized by the London County Council on the lines of the combined Neurological and Psychiatric Clinics of the Continent and America, represents the first provision of its kind by a public body in this country. Its objects are:—

- (a) Research into the pathology and treatment of Nervous and Mental Disorders;
- (b) Instruction of Medical Students and advanced post-graduate courses in Psychological Medicine;
- (c) Facilities for diagnosis of difficult cases;
- (d) **TREATMENT** of all forms of Nervous Disorders (both organic and functional), including early and recoverable forms of mental disturbance.

Admission as in-patients of the psychoses is limited to those of good prognosis, except in very special cases for diagnosis or of particular value for research or teaching.

Approval by the Medical Superintendent is an indispensable preliminary.

Treatment is entirely on a voluntary basis. Every in-patient is required to sign an application form for admission, and is entitled to leave within 24 hours of notifying desire to do so. Restriction of liberty while in Hospital is reduced to a minimum.

The special features of treatment at this Hospital for mental disturbances include (1) Complete absence of association with the certified insane and of the stigma connected with this; (2) Careful separation from admission of the quiet from restless cases; (3) A Medical Staff sufficiently numerous for modern individual psychotherapy; (4) All means of physical treatment; (5) The services of eminent specialists in various branches of medicine and surgery; (6) The co-operation of a Pathological Department under Dr. F. L. GOLLA, ensuring application of the most modern methods; (7) A very numerous, highly educated, and experienced nursing staff, almost entirely women.

OUT-PATIENTS are seen at 2 p.m. (Men on Mondays and Thursdays, Women and Children on Tuesdays and Fridays). All types of nervous and mental disorder are eligible for treatment in this Department.

IN-PATIENTS: Accommodation includes—

- (a) 144 Beds (both sexes) in wards or separate rooms.
- (b) 13 Private rooms (for Ladies) with special sitting rooms, garden, and dietary.

TERMS:

- (a) £5 a week, but in case of patients with a legal settlement in the County of London a less sum may be charged according to means.
- (b) £6 6s. a week.

All communications should be addressed to the *Medical Superintendent*.

Ad. 4

ROYAL LONDON OPHTHALMIC HOSPITAL

(MOORFIELDS EYE HOSPITAL)

CITY ROAD, E.C.1.

Registered Students of Medicine and qualified Medical Practitioners may enter on the practice of the Royal London Ophthalmic Hospital (Moorfields) at any time, and are on certain conditions eligible for appointment as Chief Clinical Assistant, Clinical Assistant, and Junior Assistant.

Two courses of Instruction, extending over a period of 5 months each, begin in October and March respectively:—

1. PRACTICAL REFRACTION CLASSES.
2. METHODS OF EXAMINATION (PRACTICAL) AND USE OF THE OPHTHALMOSCOPE.
3. LECTURES every evening, except Saturday, at 5.30—6.30,
On the following subjects:—(a) Anatomy; (b) Physiology; (c) Optics;
(d) Pathology; (e) Ophthalmic Medicine and Surgery:—
Consisting of:—Medical Ophthalmology, External Diseases of the Eye,
Motor Anomalies and Squint, Diseases of the Fundus.
4. CLINICAL LECTURES (Tuesdays at 5.30 p.m.).
5. PRACTICAL PATHOLOGY.
6. PRACTICAL BACTERIOLOGY.
7. OPERATIVE SURGERY.
8. OPHTHALMOSCOPIC CONDITIONS (Weekly demonstrations).
9. RADIOGRAPHY & RADIOTHERAPY.
10. DISCUSSION CLASSES.
11. COURSES ON THE SLIT LAMP.

FEES.—A composition fee of 24 Guineas will entitle the Student to a perpetual ticket for the practice of the Hospital, including attendance for one session on the above courses, with the exception of those on practical Pathology and Bacteriology.

An additional special course in the preliminary subjects, viz.:—Anatomy, Physiology, and Optics, for the D.O.M.S. and other Ophthalmology Examinations, will be held twice a year, immediately preceding the date of the examination. The fee for this course is 12 Guineas, or 5 Guineas for any one subject separately.

FEES FOR THE PRACTICE OF THE HOSPITAL:

Perpetual - £5 5 0; Three to Six Months - £3 3 0; Two Months - £2 2 0; One Month - £1 1 0
Clinical work begins at 9 a.m. Operations are performed daily between 10 and 1.

For further particulars apply to the Secretary of the Royal London Ophthalmic Hospital, City Road, E.C.1; or to the Dean of the Medical School, Mr. M. L. HERBURN.

HOSPITAL for CONSUMPTION & DISEASES OF THE CHEST, and SANATORIUM at FRIMLEY. Brompton

Students and qualified men are admitted to the practice of the Hospital and the lectures on payment of a Fee of One Guinea for One Month; Two Guineas for Three Months. Clinical Assistants to the Out-patients' Department are appointed for Six Months, and are expected to join the practice of the Hospital for that period. A certificate is given to those who have attended a six months' course with satisfaction. The Hospital practice includes out-patient and in-patient clinics, demonstrations in the Clinical Laboratory, Museum, Special Departments, and Artificial Pneumothorax.

Full particulars can be obtained from L. S. BURRELL, Dean.

THE ROYAL NATIONAL HOSPITAL

For CONSUMPTION AND DISEASES OF THE CHEST.
VENTNOR, ISLE OF WIGHT.

For the less well-to-do, Open-air Treatment is afforded under the most advantageous conditions in the Undercliff of the Isle of Wight.

Terms 3 guineas a week; or 30/- a week with a governor's Letter of Recommendation.

Further particulars may be obtained from the Secretary:

R. N. H. C., 18, Buckingham Street, Strand, W.C.2.

Charing Hospital Medical School

(University of London)

WITH WHICH IS AFFILIATED THE

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL,OPEN TO MEN AND WOMEN STUDENTS. SESSIONS commence ^(adjoining) **MAY & OCTOBER**The **most central** of all the **Colleges of the University.**

Complete Hospital and School arrangements for all departments of Clinical work.

The **INSTITUTE OF PATHOLOGY** includes a series of Laboratories fully equipped for Student, Post-graduate, and Research work.**STUDENTS' CLUB ROOMS** and **RESTAURANT** on the School premises.A new **ATHLETIC GROUND** ($6\frac{1}{2}$ acres) has recently been acquired at Eastcote, and is now in use.**FOUR SCHOLARSHIPS** each of the value of 40 guineas per annum and tenable for three years are awarded annually to students who have completed the Second Medical Examination of Oxford or Cambridge University. Examinations for these Scholarships are held in July each year.**FEES LOW AND INCLUSIVE. NO EXTRAS.***For Prospectus and full information apply personally or by letter to the Dean:*

Tel. No.: Regent 2503.

W. J. FENTON, M.D., F.R.C.P.,
Charing Cross Hospital Medical School, London, W.C. 2.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

DENMARK HILL, LONDON, S.E.5.**King's College Hospital** (planned to contain 600 beds) is equipped with the most modern appliances. It is easily reached from all parts of London.**Complete Training** is provided in all subjects for Medical Degrees and Diplomas. **The New School of Dental Surgery** provides full courses for Dental Degrees & Diplomas. **The Hall of Residence** is near the School; also **The Athletic Ground.****Two Raymond Gooch Scholarships** (£120 each), **Two Burney Yeo Scholarships** (£80 each), and **Three Entrance Scholarships** (£50 each), for University Students, will be offered for competition during 1926.The Calendar containing details of Scholarships, etc., will be sent on application to the **DEAN:**
H. WILLOUGHBY IYLE, M.D., B.S. (Lond.), F.R.C.S., ————— or to the Secretary:
S. C. RANNER, M.A. (Cantab.), KING'S COLLEGE HOSPITAL MEDICAL SCHOOL,
DENMARK HILL, LONDON, S.E.5.

ROYAL DENTAL HOSPITAL OF LONDON

SCHOOL OF DENTAL SURGERY (University of London),
Leicester Square, LONDON, W.C.2.

THIS SCHOOL is thoroughly equipped for Teaching Dental Surgery. The CLINIC of the Hospital is UNRIVALLED.

DENTAL MECHANICS—Pupils may join in May and October for the two years' Training in Dental Mechanics.**WOMEN** are admitted as Students, and are eligible for all appointments and prizes.*For further particulars apply THE DEAN.*

UNIVERSITY OF BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental Department affords the necessary instruction for the Degrees and Diploma of the University and of other examining bodies in that subject.

The University confers the following Degrees and Diplomas :

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B.
MASTER OF SURGERY	Ch.M.
DOCTOR OF MEDICINE	M.D.
DOCTOR OF PHILOSOPHY	Ph.D.
BACHELOR OF DENTAL SURGERY	B.D.S.
MASTER OF DENTAL SURGERY	M.D.S.
DIPLOMA IN DENTAL SURGERY	L.D.S.
DIPLOMA IN PUBLIC HEALTH	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 618 beds. The Bristol Royal Hospital for Sick Children and Women (109 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

SCHOLARSHIPS.—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer), one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon, one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE,

NEWCASTLE - UPON - TYNE.

DEGREES IN MEDICINE, SURGERY, HYGIENE, AND DENTISTRY, DIPLOMAS IN PUBLIC HEALTH AND PSYCHIATRY AND LICENCE IN DENTAL SURGERY—Two Diplomas, one Licence and nine Degrees are conferred by the University of Durham—viz. Diploma in Public Health, Diploma in Psychiatry, Licence in Dental Surgery, and the Degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery and Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery and Master of Dental Surgery. These Degrees, Diplomas and Licence are open to men and women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees except in the case of Practitioners of more than fifteen years' standing, who having attained the age of forty years can obtain the Degree of M.D. after examination only.

Students can complete at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal College of Physicians and Surgeons.

A Dental Curriculum is provided, and a Licence and Degrees in Dental Surgery may be obtained after examination.

The Royal Victoria Infirmary contains 550 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given by the Pathologist. Practical Midwifery can be studied at the Princess Mary Maternity Hospital, which contains 80 beds, with an annual indoor and outdoor attendance on 3000 cases.

Post Graduate Courses (general and special) are held under the joint auspices of the College and the Royal Victoria Infirmary.

Particulars regarding scholarships, fees, etc., may be obtained from PROFESSOR HOWDEN, Registrar, at the College.

PLAISTOW HOSPITAL, LONDON, E.13.

INSTRUCTION IN FEVERS, Etc.

This Hospital is fully equipped for instruction in infectious diseases. It is recognized by the Universities of London, Cambridge, and Oxford, the Royal Colleges of Physicians and Surgeons, etc.

CLASSES FOR MEDICAL STUDENTS are held on Tuesdays and Fridays throughout the year, except in August and September. There is a morning class at 10.45 and an afternoon class at 2.15. Fee for a two months' course, three guineas; for a three months' course, four guineas. In the event of there being smallpox cases at Dagenham Hospital during the Students' course, instruction in that disease will be included: qualified men can attend this course. Special arrangements made for D.P.H. students.

Enquiries and applications to join above Courses should be addressed to Dr. MacIntyre, Medical Superintendent, Plaistow Hospital, E.13. The Superintendent can also be seen at the Hospital on week-days at 2 p.m.

The Hospital is situated near Upton Park Station, to which frequent trains run on the District and Midland Railways.

THE HOSPITAL FOR SICK CHILDREN

GREAT ORMOND STREET, W.C.1

Clinical Instruction is given daily by Members of the Visiting Staff in the Wards, Out-patient Department, Operating Theatre, and Post-mortem Room.

Clinical Clerkships and Dresserships in the Wards and Clinical Assistantships in the Out-patient Department are also available for Post-Graduates, both men and women. Two months of the time spent as Clerks or Dressers by Undergraduate Students is recognized by the Universities of London, Oxford, Cambridge, etc., and by the conjoint Examination Board of England for their final examinations.

Fees for Hospital Attendances: One Month's Ticket, £2 2s. Three Months' Ticket, £5 5s. Perpetual Ticket, £10 10s.

Special Reduced Fee for Clinical Clerks, £1 1s. per month.

Further particulars may be obtained from the Secretary or the Dean.

WILFRED J. PEARSON, D.M., *Dean to the Medical School.*

NATIONAL HOSPITAL, QUEEN SQUARE

**For the Relief and Cure of Diseases of the
Nervous System, including Paralysis and Epilepsy
LONDON, W.C.1.**

The Out-Patient Practice is open from 2 o'clock every day (except Wednesdays and Saturdays).

The In-Patient Practice is open at 2 o'clock. The Physicians attend on Monday, Tuesday, Thursday, and Friday at 2 o'clock.

Clinical Clerks are appointed to each Physician for three months, and fifth-year Students are eligible who have filled the post of Clinical Clerk at a General Hospital. They are required to pay the Fees, which are: three months, £5 5s.; six months, £7 7s.

Three Post-graduate Courses are given yearly—spring, summer, and winter terms. Special Courses in the anatomy, physiology, and pathology of the nervous system and in the neurology of the eyes are also given. For these Courses a Special Fee is charged.

Surgical Operations are performed by the Surgeons at 9 a.m. Tuesdays and Fridays. All communications should be made by letter only, addressed to the Secretary, at the Hospital, from whom forms of application for the Hospital appointments may be obtained, and to whom all Fees are payable.

J. G. GREENFIELD, *Dean of the Medical School.*

UNIVERSITY OF EDINBURGH

SESSION 1925-26.

Principal—Sir J. ALFRED EWING, K.C.B., M.A., D.Sc., LL.D., F.R.S.

The WINTER SESSION, 1925-26, opens on 6th October, and closes on 19th March.

The SUMMER SESSION, 1926, opens on 20th April, and closes on 2nd July.

FACULTY OF MEDICINE.

Dean—PROFESSOR J. LORRAIN SMITH, M.A., M.D., LL.D., F.R.S.

The Faculty embraces 19 Chairs and 65 Lectureships; and attached to these Chairs there are about 40 Assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.:—

PROFESSORS:

Chemistry—George Barger, D.Sc., F.R.S.
Zoology—J. Ossar Ewart, M.D., F.R.S.; J. H. Ashworth, D.Sc., F.R.S.
Botany—Wm. Wright Smith, M.A., F.R.S.
Anatomy—Arthur Robinson, M.D. [F.R.S.
Physiology—Sir E. Sharpey Schafer, LL.D.,
Materia Medica—A. R. Cushny, M.D., LL.D.,
 F.R.S. [F.R.S.
Pathology—J. Lorrain Smith, M.D., LL.D.,
Bacteriology—Thomas Jones Mackie, M.D.,
Forensic Medicine—Harvey Littlejohn, M.B.,
 D.Sc.

UNIVERSITY

Clinical Surgery—D. P. D. Wilkie, M.D., Ch.M.;
 A. A. Scott Skirving, C.M.G., M.B., C.M.;
 Geo. L. Chiene, M.B., C.M.; W. J. Stuart,
 M.B., Ch.B.; J. W. Struthers, M.B.; Henry
 Wade, M.D.
Clinical Medicine—R. A. Fleming, M.D.; D.
 Chalmers Watson, M.D.; Edwin Matthew,
 M.D.; W. T. Ritchie, M.D.; John Eason,
 M.D.
Clinical Gynaecology—B. P. Watson, M.D.; J.
 Haig Ferguson, M.D.; William Fordyce,
 M.D.; R. W. Johnstone, M.D.; H. S. David-
 son, M.B.; James Young, M.D.
Diseases of the Eye—J. V. Paterson, M.B.;
 A. H. H. Sinclair, M.D.; H. M. Traquair,
 M.D.; E. H. Cameron, M.B.
Clinical Instruction in Diseases of Children—
 Charles McNell, M.D.; N. S. Carmichael,
 M.B., Ch.B.; Gertrude Herzfeld, M.B.;
 Norman Dott, M.B.
Anatomy—E. B. Jamieson, M.D.
Applied Anatomy—F. R. Jardine, M.B.
Histology—May I. Walker, M.A., B.Sc., M.B.
Physiological Chemistry—W. W. Taylor, D.Sc.
Experimental Physiology—Lancelot Hogben,
 M.A., D.Sc.
Physiology of the Nervous System—A. Ninlan
 Bruce, M.D., D.Sc.
Pathology—R. D. Mackenzie, M.B.; Theodore
 Retlie, D.Sc.

Public Health—(Vacant)
Medicine and Clinical Medicine—Geo. Lovell
 Gulland, C.M.G., M.D.
Surgery—D. P. D. Wilkie, M.D., Ch.M.
Midwifery and Gynaecology—Benjamin P. Wat-
 son, M.D.
Clinical Surgery—John Fraser, Ch.M., M.D.
Clinical Medicine—Edwin Bramwell, M.D.
Tuberculosis—Sir Robert W. Philip, M.D.
Therapeutics and Clinical Medicine—David
 Murray Lyon, M.D.
Psychiatry—George M. Robertson, M.D.

LECTURERS:

Morbid Anatomy—J. Davidson, M.B.
Bacteriology—George Buchanan, M.B.
Physics—G. A. Currie, M.A., D.Sc.
Diseases of the Larynx, Ear and Nose—John S.
 Fraser, M.B.; J. D. Lithgow, M.B.; W. T.
 Gardiner, M.B.; G. Ewart Martin, M.B.
Tropical Diseases—Lt.-Col. E. D. W. Greig,
 C.I.E., M.D.
Med. Entomology and Parasitology—J. H. Ash-
 worth, D.Sc., F.R.S.; W. S. Patton (Major,
 I.M.S.)
Tropical Hygiene—J. B. Young, M.B., D.Sc.
 (conjointly with Professor).
Diseases of the Skin—Frederick Gardiner, M.D.;
 R. Cranston Low, M.D.
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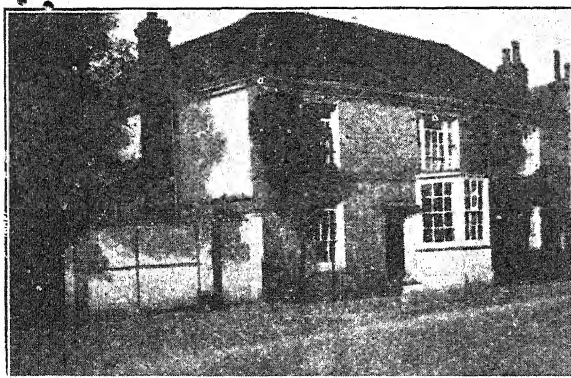
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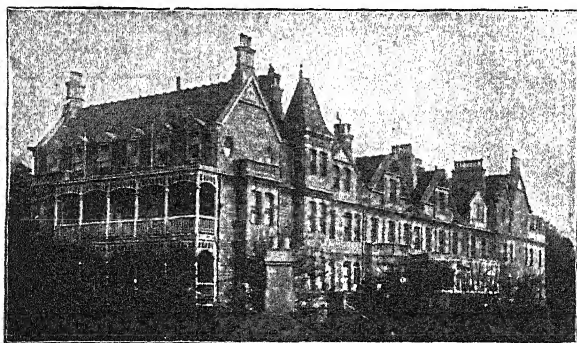
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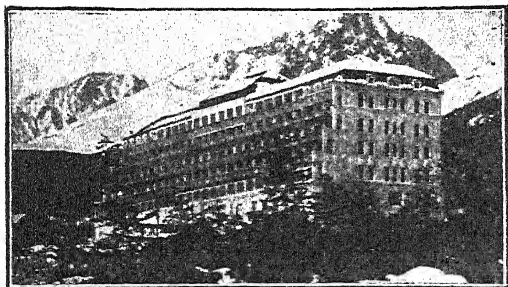
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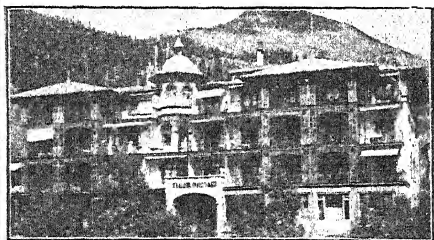
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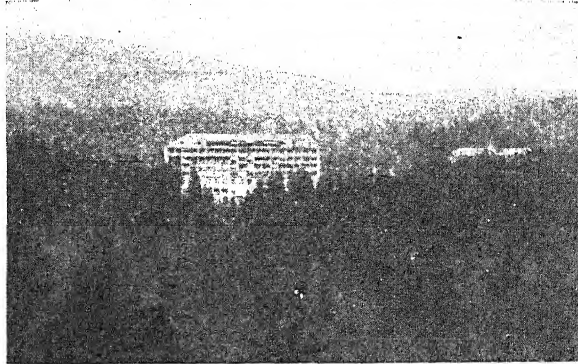
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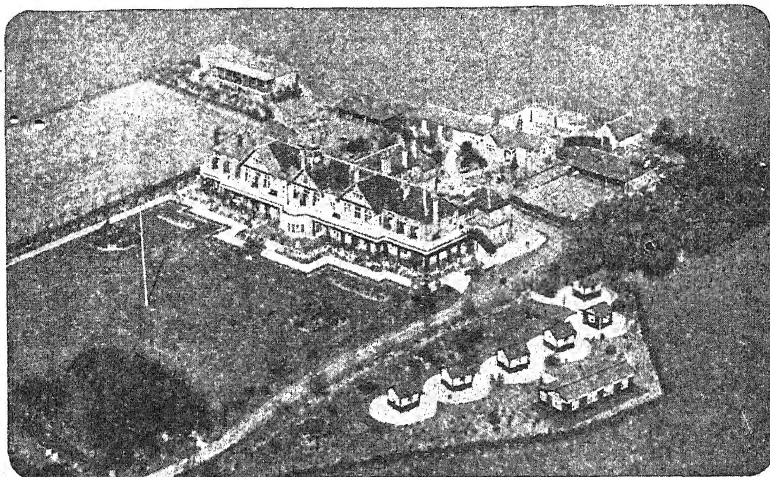
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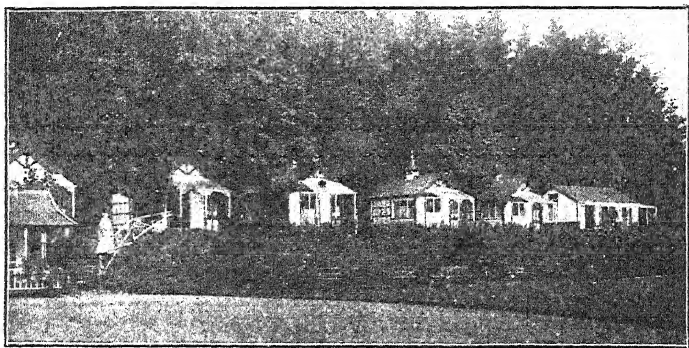
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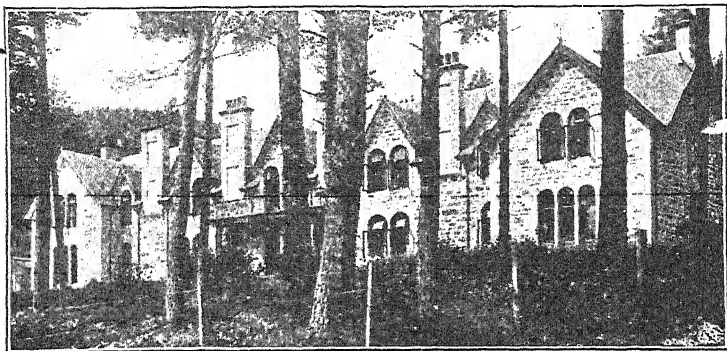
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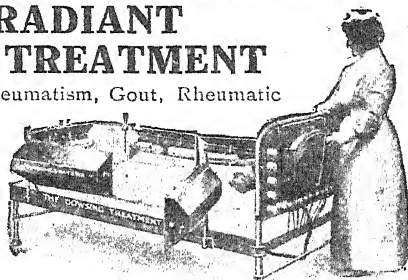
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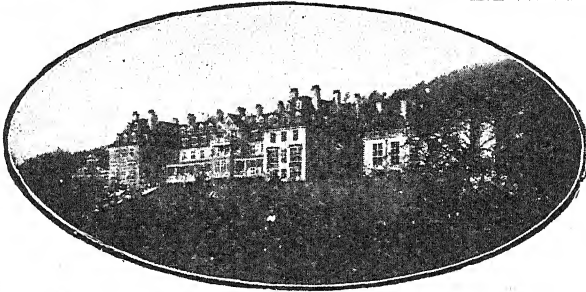
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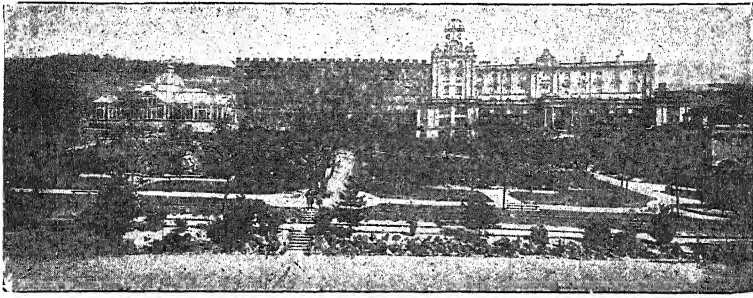
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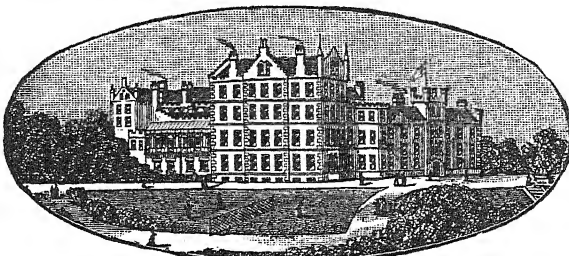
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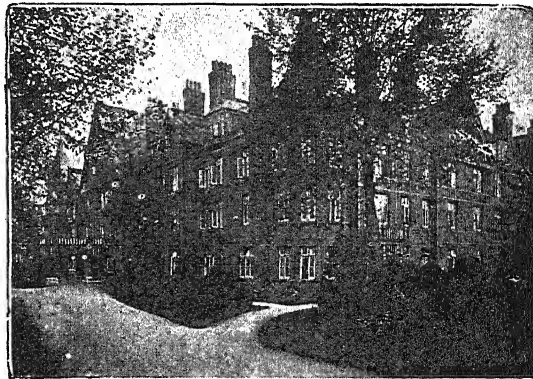
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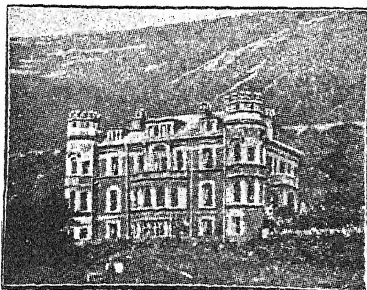
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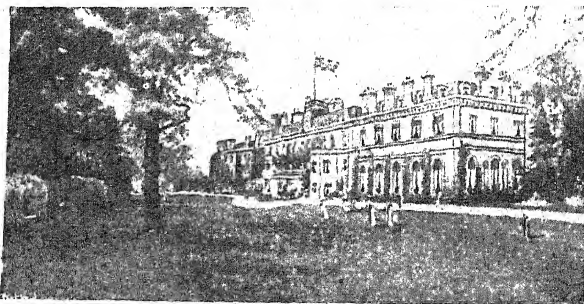
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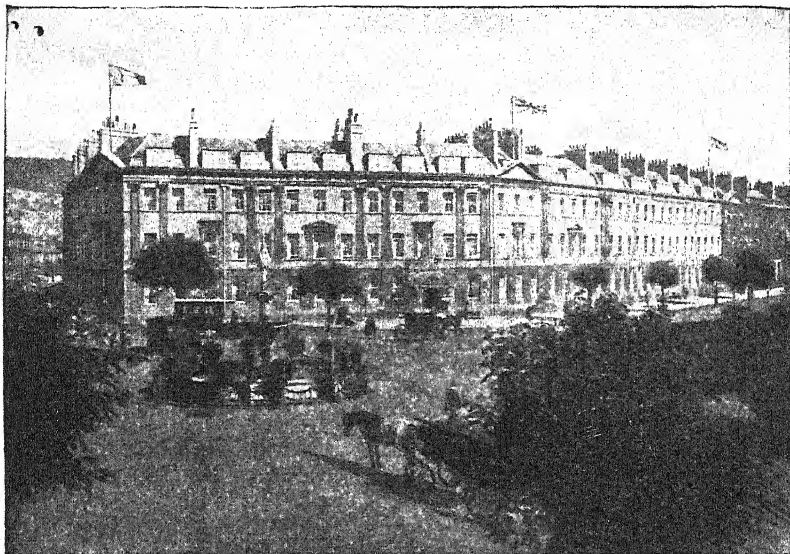


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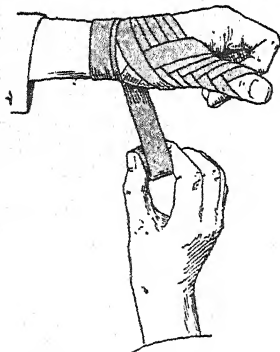


Fig. 10L.—The Spica for the Back
of the Thumb.

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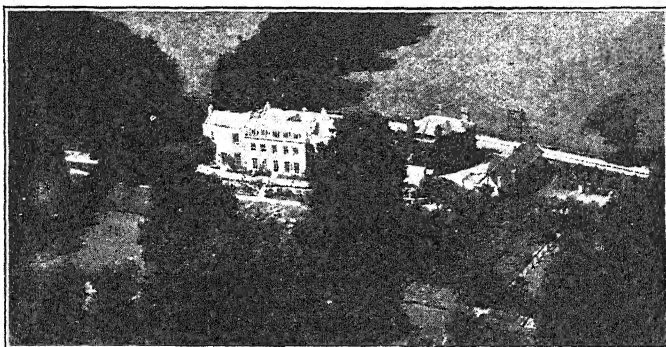
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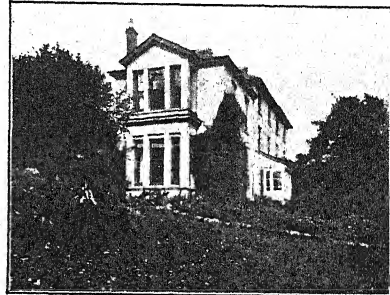
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Assistant Medical Officers: ROBERT THOMPSON, M.B., B.Ch.

ROBERT TAYLOR, L.R.C.P. and S.I.

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For forms and further particulars apply to Mr. A. E. Coe, Registrar, St. Patrick's Hospital, James's Street, Dublin; or, in case of urgency, to the Medical Superintendent.

Telephones: Dublin 538. Lucan 21.

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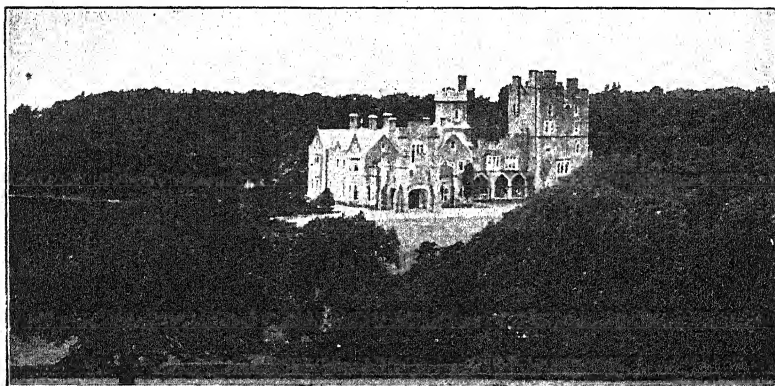


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Hospital for Mental Diseases.

President: The Right Hon. EARL MANVERS.

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Voluntary Boarders admitted without Certificates.

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of the INSANE and of NERVOUS INVALIDS
— of the MIDDLE and UPPER CLASSES. —*

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The Ladies' Division is directly supervised by Mrs. SANKEY.

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Carriages, horses, motor, lawn-tennis, golf, and fishing are provided.

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Letters and Telegrams should be addressed to—

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A Registered Hospital for the Care & Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders. . .

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THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 70 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

VOLUNTARY BOARDERS ARE RECEIVED.

For terms and further particulars, apply to the—

Physician Superintendent, ALEX. W. NEILL, M.D.

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For Terms and further information apply to the MEDICAL SUPERINTENDENT.

Telephone - Gatley 163.

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Established
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For terms and further particulars apply to
THE MEDICAL SUPERINTENDENT.

Telegrams : "Fox, Brislington."

Telephone : No. 2 Brislington.

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PAYING PATIENTS
into the Hospital at
moderate charges.

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Private Patients. Special accommodation for Male Paying Patients is provided at "The Hall," adjoining this Mental Hospital.

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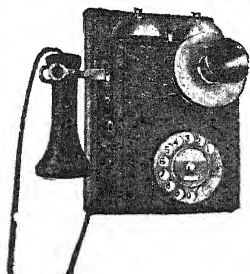
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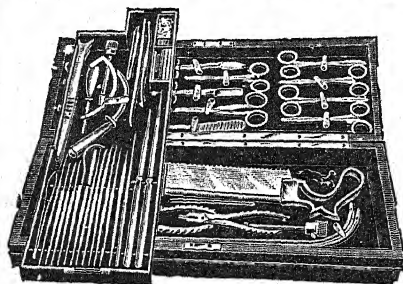
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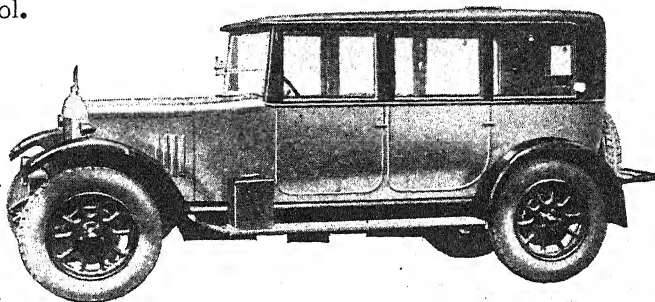
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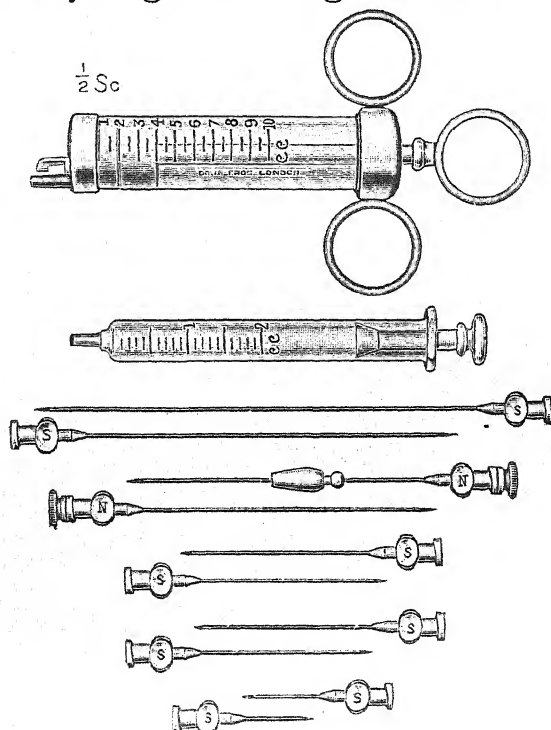
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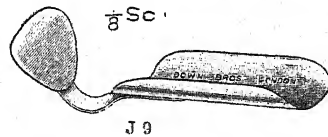
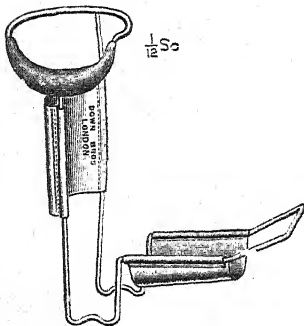
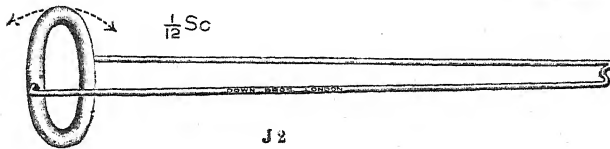
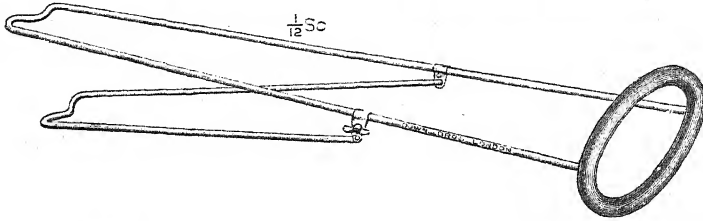
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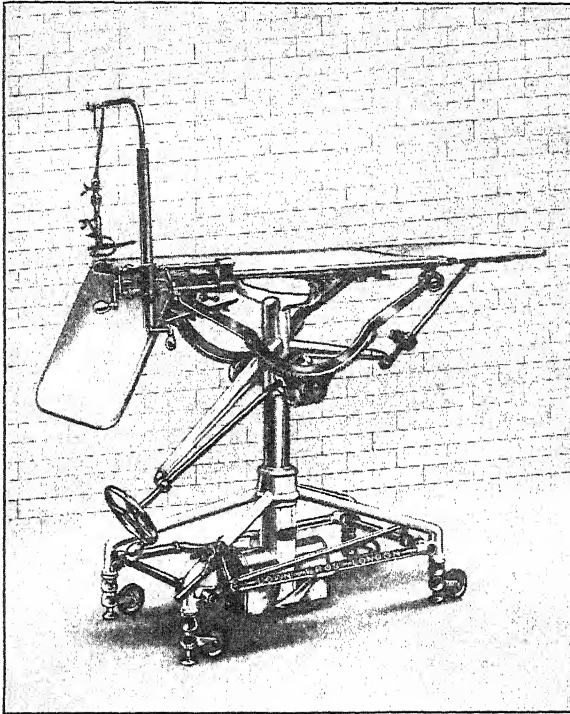
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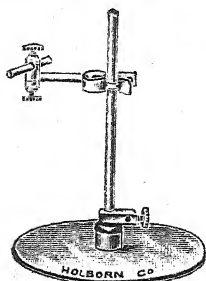
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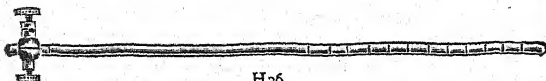
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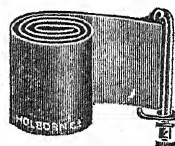
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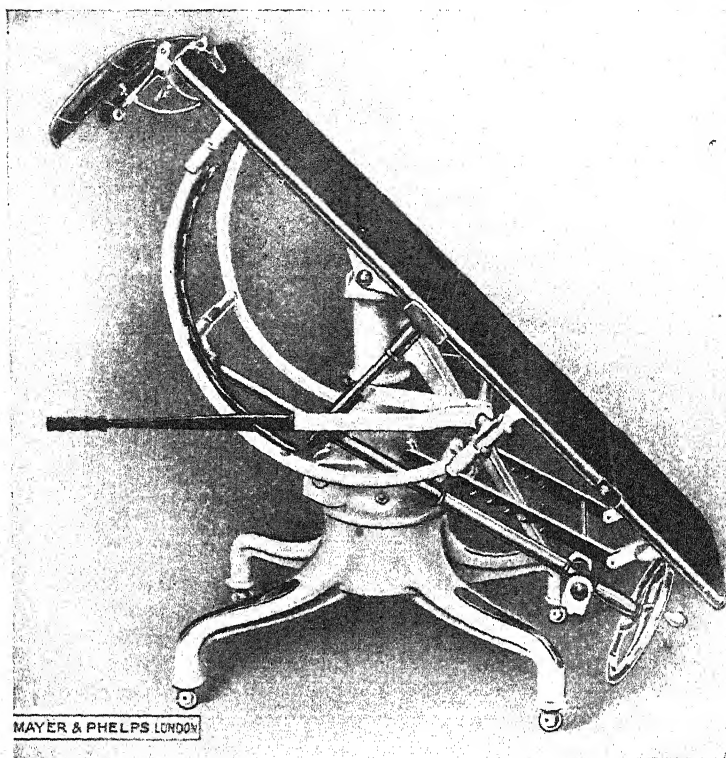
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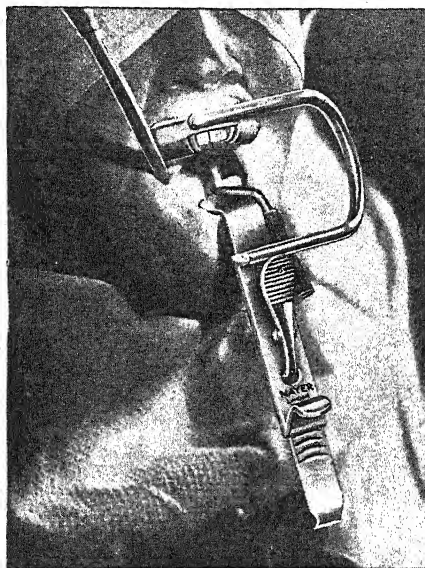
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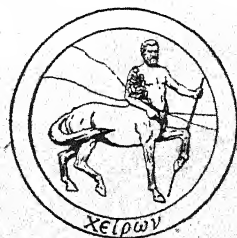
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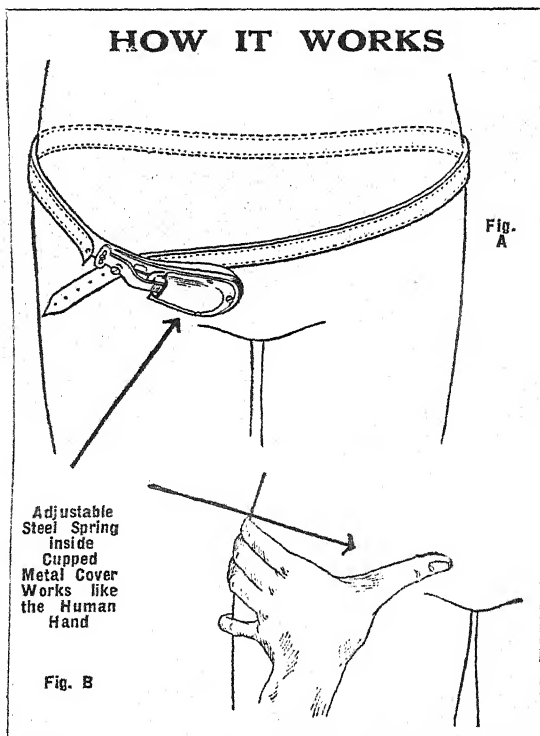
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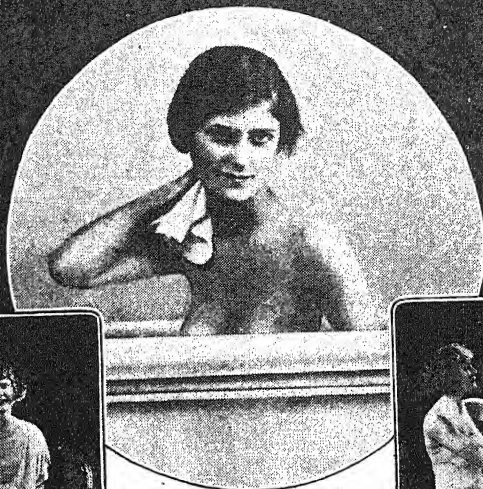
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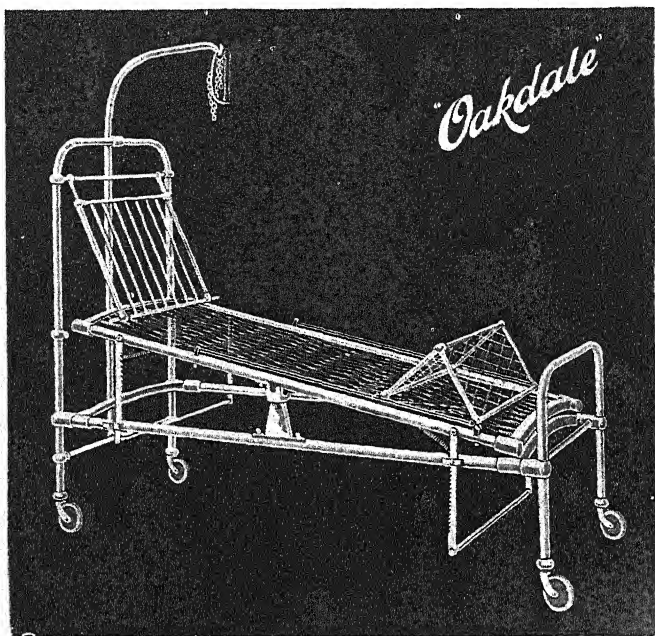
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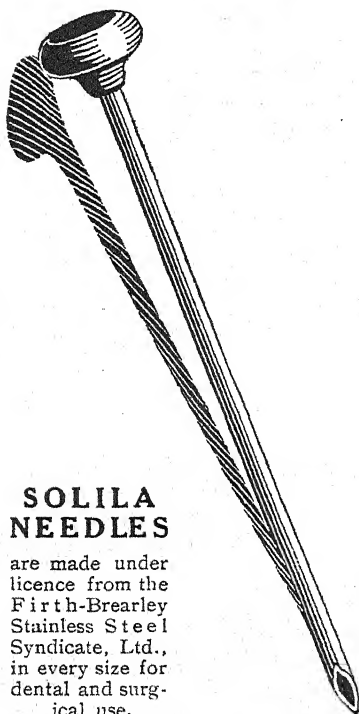
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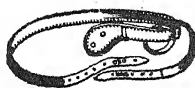
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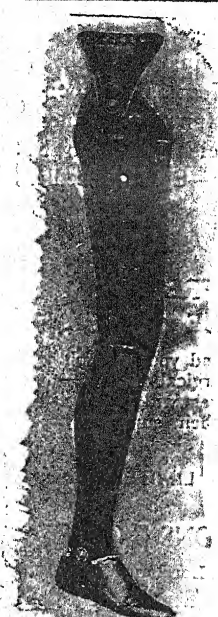
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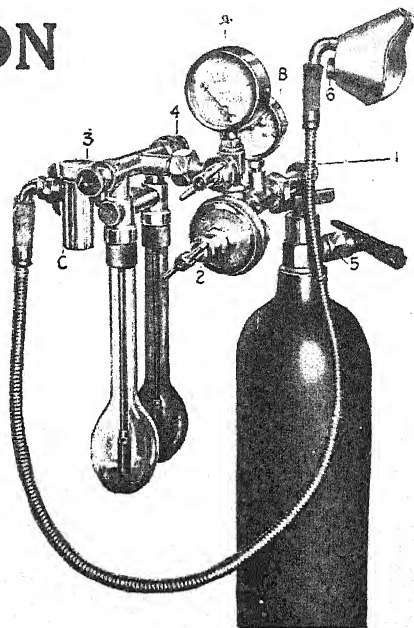
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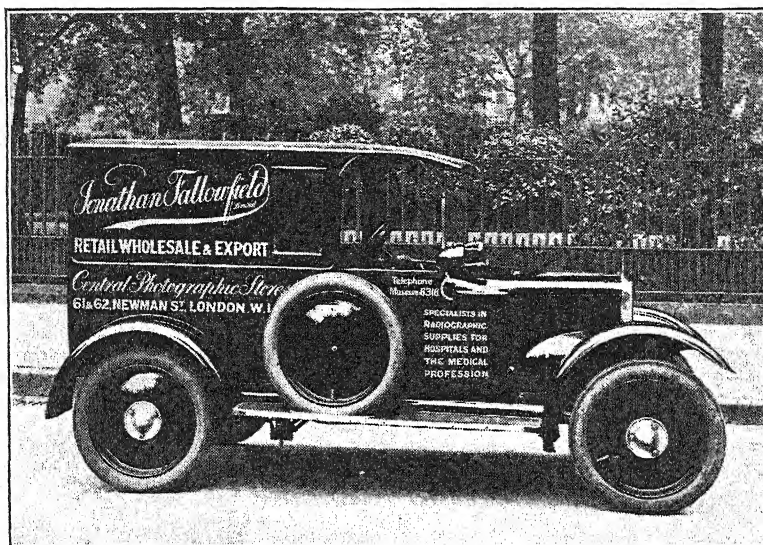
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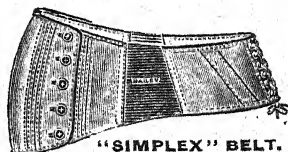
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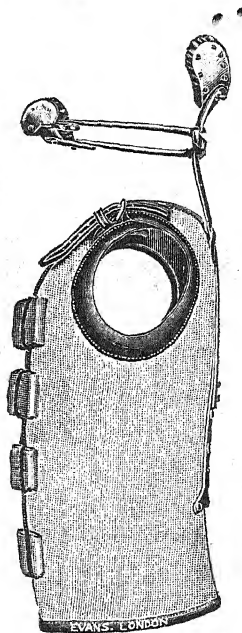
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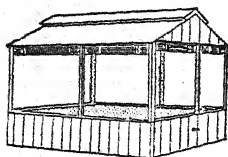
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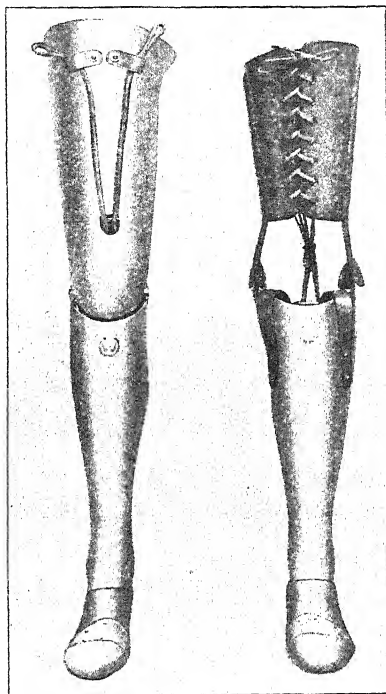
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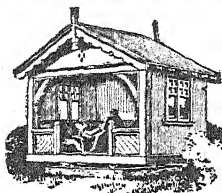
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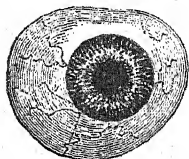


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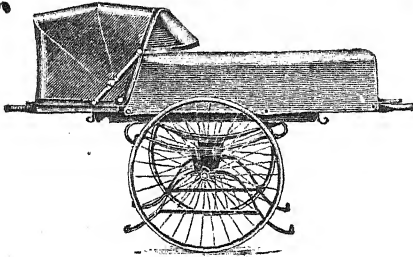
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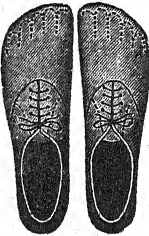
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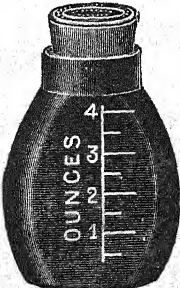
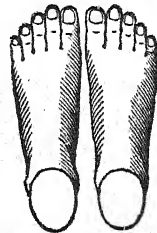


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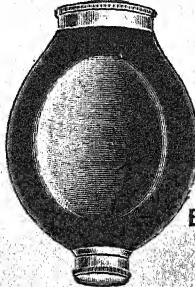
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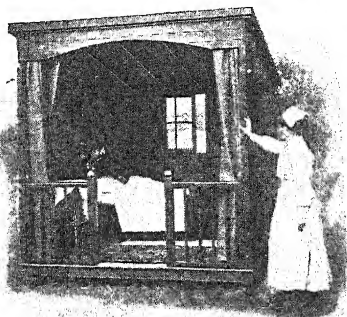
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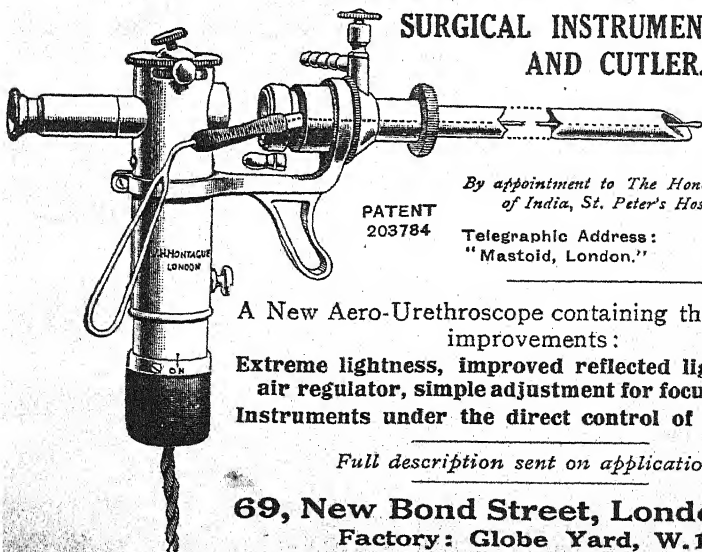
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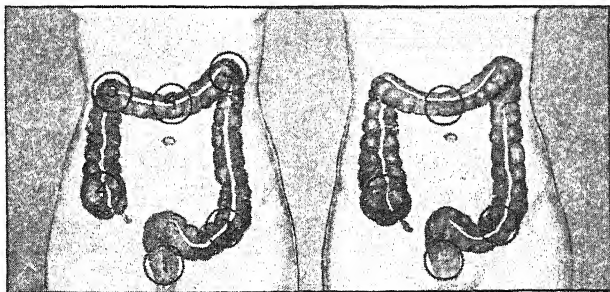
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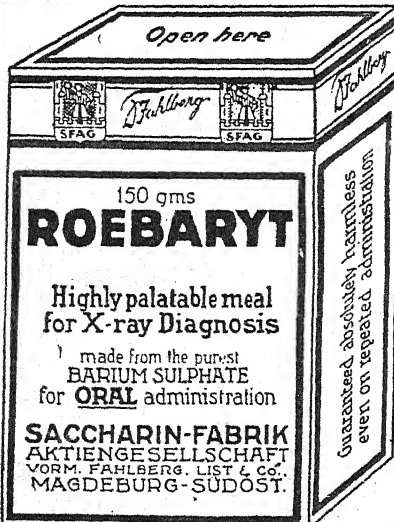
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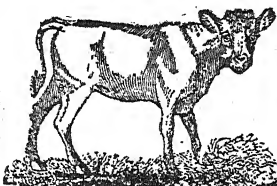
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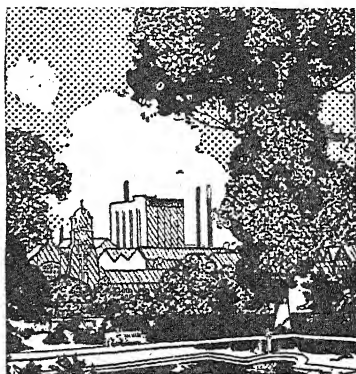
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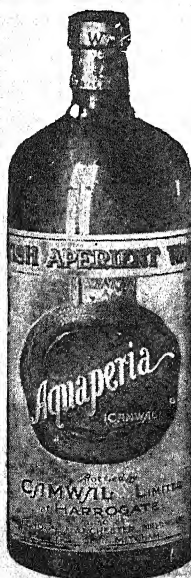
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